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PATENT AND TRADEMARK OFFICE NOTICES

Registration to Practice

The following are names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before November 5, 1976.

Cantor, Alan I., 8334 Wickham Road, Springfield, Va. 22152
Mirabito, Anthony J., 4721 Ellicott St. NW., Washington, D.C. 20016
Summer Leonard, 1717 Tilton Drive, Silver Spring, Md. 20902
Wahl, Richard A., 1981 Hawaii Ave. NE., St. Petersburg, Fla. 33703

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

National Inventor's Day

The 5th Annual Inventor's Day Exposition will be held on Saturday and Sunday, February 5 and 6, 1977 at the Patent and Trademark Office in Arlington, Virginia.

Limited space is available for appropriate display and demonstration of patented materials, devices or methods. Such limited space dictates early consideration by prospective participants. No application can be considered after December 1, 1976.

Other than electricity and alloted space—floor, wall or table top—all expenses associated with each exhibit are to be borne by the exhibitor. Arrangements for delivery, return, setup, and teardown as well as individual exhibit personnel are the exhibitor's responsibility. Neither the Patent and Trademark Office, nor individual employees, can accept a collect shipment or provide storage.

The Patent and Trademark Office has established a committee which will select the items to be exhibited and allot available space. Suitability for dynamic demonstration and current public interests are prime considerations in selecting exhibits.

Inventors or firms interested in participating in this public exhibit are urged to contact the National Inventor's Day Committee of the Patent and Trademark Office (phone 703 557–3428). Communications should be directed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. Attn: Oscar Mastin, Office of Information Services.

I. J. ROTKIN,
June 14, 1976. *Chairman.*

Change of Address or Practitioner in a Plurality of Patent Applications

Change of Address

This notice is supplemental to the Notice of May 28, 1975, 935 O.G. 1352.

In those instances where a change in the correspondence address of a registered attorney or agent is necessary in a plurality of applications, and the number of applications is such as to cause undue hardship, the notification filed in each application may be a reproduction of a properly executed, original notification. The original notice may be sent to the Office of the Solicitor as notification to the Attorney's Roster of the change of address, or may be filed in one of the applications affected, provided that the notice includes an authorization for the public to inspect and copy the original notice in the event one of the applications containing a copy matures into a patent and the application containing the original paper is either pending or has become abandoned. The copies submitted in each affected application must identify where the original paper is located. Otherwise, the practice governing the filing of notifications of change of address remains the same.

Powers of Attorney

In the event of a need to file a change in the power of attorney in a plurality of applications of a common assignee or inventive entity, and the number of applications is such as to cause undue hardship, a single, original paper may be used provided that a reproduction of this original paper is supplied in each of the affected applications. The copy of the original paper must identify in which application the original paper is located and authorize the public to inspect and copy the original paper in the event one of the applications containing a copy matures into a patent and the application containing the original paper is pending or has become abandoned. The procedures and usual prerequisites for the filing of grants and/or revocations of power of attorney otherwise remain the same.

WILLIAM FELDMAN,
Sept. 9, 1976. *Deputy Assistant Commissioner for Patents.*

Patent Suits

Notices under 35 U.S.C. 290: Patent Act of 1952

2,811,069, A. H. Faulkner, ELECTRICAL MUSICAL INSTRUMENT, **filed** Jan. 17, 1973, D.C., N.D. Ill. (Chicago) Doc. 73c136, *Alfred H. Faulkner* v. *Baldwin Piano and Organ Co.* It is hereby ordered and adjudged that the plaintiff take nothing, that the action be dismissed on the merits, Apr. 19, 1976.

2,849,914, C. Vinten, FILM DRIVE MECHANISMS IN HIGH SPEED CAMERAS; **2,921,511,** same, CONTROL OF THE IRIS APERTURE SIZE IN PHOTOGRAPHIC CAMERAS; **2,931,284,** same, CURTAIN SHUTTER FOR CAMERAS, **filed** Feb. 9, 1976, United States Court of Claims (District of Columbia) Doc. 36–76, *W. Vinten Limited* v. *The United States.*

2,921,511. (See 2,849,914.)

2,928,211, I. Z. Martin, HYDROPONIC APPARATUS; **3,458,951,** HYDROCULTURE GRASS UNIT, **filed** Dec. 22, 1975, D.C. Ariz. (Phoenix) Doc. C–75–872–Phx CAM, *S.A. Tombra* v. *Hydroculture, Inc.*

2,931,284. (See 2,849,914.)

3,036,189, E. H. Keller, FISHING LINE, **filed** Aug. 1, 1975, D.C., N.D. Iowa (Sioux City) Doc. C75–4045, *E. I. du Pont de Nemours & Company* v. *Berkley & Company, Inc.*

3,071,118, J. K. Wilden, ACTUATOR VALVE MEANS, **filed** Jan. 7, 1976, D.C., N.D. Calif. (San Francisco) Doc. C–76–30 SW, *Wilden Pump & Engineering Co.* v. *Pressed & Welded Products Co. et al.*

3,144,149, Dempster, Herpich and Harvey, TRANSPORTING EQUIPMENT FOR CONTAINERS; **3,229,622,** French and Toppins, STATIONARY PACKER ASSEMBLIES, **filed** in the United States Court of Claims (District of Columbia) Doc. 267–74, *Carrier Corporation* v. *The United States.* Action for alleged use of U.S. Patent 3,144,149, in performance of a control by another for the Government, held that use of the patented invention was by the contractor and not of the Government, Jan. 28, 1976.

3,148,510, R. J. Sullivan, METHOD OF INSTALLING EARTH ANCHORS, **filed** Sept. 11, 1975, D.C., E.D. Mo. (St. Louis) Doc. 75–795C(4), *Joslyn Mfg. and Supply Co.* v. *A. B. Chance Company and Emerson Electric Co.*

3,180,074, J. F. Smith, GH SPEED SPINDLE APPARATUS, **filed** July 30, 1975, D.C., M.D.N.C. (Greensboro) Doc. C–75–316–G, *Joseph F. Smith* v. *ARCT Incorporated.* **Same, filed** July 30, 1975, D.C., M.D.N.C. (Greensboro) Doc. C–75–317–G, *Joseph F. Smith* v. *Macfield Texturing, Inc.*

3,194,609, L. Thurlow, SPROCKET AND CHAIN DRIVE, **filed** Nov. 25, 1975, D.C. N. Dak. (Fargo) Doc. A3–75–107, *Deere and Company* v. *Lloyd Thurlow.*

3,229,622. (See 3,144,149.)

3,250,095, J. J. Bird, SOCK FOR ACTIVE PARTICIPATOR SPORTS, **filed** Dec. 22, 1975, D.C., E.D. Tenn. (Knoxville) Doc. 3–75–374, *Rockford Textile Mills, Inc.* v. *Burlington Industries, Inc.*

3,283,712, L. J. Chambon, WIPER ROLL INKING DEVICE FOR PRINTING MACHINES USING FATTY INKS, **filed** Oct. 7, 1975, D.C., N.D. Tex. (Dallas) Doc. CA3–75–1240, *Societe d'Etudes de Machines Speciales* v. *Dahlgren Manufacturing Company.*

3,305,536, P. F. Warner, POLYSULFIDE POLYMERS, **filed** Feb. 18, 1975, D.C., S.D. Calif. (San Diego) Doc. 75–0096–T, *Johnson & Johnson and Dispersalloy, Inc.* v. *Gary Weikel.* Consent order—action settled, with defendant taking a license under the patent, Jan. 20, 1976.

3,310,435, Robinson, Jr., Steelman, Jr. and Perkins, Jr. PROCESS FOR CONTINUOUS PICKLING OF STEEL STRIP AND REGENERATION OF THE CONTACT ACID; **3,445,284,** Robinson, Jr. and Steelman, Jr., PROCESS FOR PICKLING OF STEEL STRIP AND REGENERATION OF THE CONTACT ACID; **3,669,623,** Allison, Hatfield and Frumerman, METHOD FOR THE REGENERATION OF HYDROCHLORIC ACID FROM SPENT PICKLE LIQUOR AND LIKE SOLUTIONS, **filed** Sept. 4, 1974, D.C., W.D. Pa. (Pittsburgh) Doc. C.A. 74–840, *Dravo Corporation* v. *Pa. Engineering Corp.* Action dismissed by stipulation and order of Court, entered May 3, 1976. **Same, filed** Oct. 28, 1975, D.C., W.D. Pa. (Pittsburgh) Doc. 75–1377, *Woodall Duckham (USA) Ltd.* v. *Dravo Corp.* Order entered dismissing case with prejudice pursuant to consent of parties, May 3, 1976.

3,404,887, O. J. Dundr, BULLET TRAP WITH UPWARDLY INCLINED IMPACT PLATES; **3,737,165,** G. Pencyla, SHOOTING RANGE BULLET TRAP STRUCTURE, **filed** May 6, 1976, D.C. Minn. (Minneapolis) Doc. 4–76–C–202, *Caswell Equipment Company, Inc.* v. *Korhummel Industries, Inc.*

3,445,284. (See 3,310,435.)

3,458,783, M. A. Rosenberg, HERMETICALLY SEALED CAPACITOR, **filed** Jan. 16, 1975, D.C., C.D. Calif. (Los Angeles) Doc. 75–154 WPG, *San Fernando Electric Mfg. Co.* v. *Varadyne Industries, Inc.* Consent judgment and order thereon that said patent is valid, and defendants are enjoined from using, selling, etc. products of said patent, entered Sept. 24, 1975.

3,458,951. (See 2,928,211.)

3,565,454, R. L. Stevenson, SKATEBOARD WITH INCLINED FOOT-DEPRESSIBLE LEVER, **filed** May 4, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV76–1449–IH, *American Lighting Specialties, Inc.* v. *Richard Lawrence Stevenson.*

3,669,623. (See 3,310,435.)

3,737,165. (See 3,404,887.)

3,743,280, D. G. Martinez, EXERCISING DEVICE, **filed** Mar. 24, 1976, D.C. Puerto Rico (San Juan), Doc. 76–334, *Rainbow Lifegard Products, Inc., doing business as Rainbow Plastics* v. *Eduardo Diaz Irizarry, doing business as Eddie Imports and Eddie Carpet, Inc.* Action is hereby dismissed pursuant to Rule 41(a)(1)(1) of the Federal Rules of Civil Procedure, Apr. 27, 1976.

3,743,289, D. L. Golomb, BASEBALL BASE AND FASTENER THEREFOR, **filed** May 5, 1976, D.C. Mass. (Boston) Doc. CA 76–1780–T, *Rainbow Lifegard Products Inc.* v. *L. J. Shulman & Son Inc. and Charles Shulman.*

3,751,399, Lee, Jr. and Stoffey, POLYACRYLATE RESIN COMPOSITIONS; **3,792,531,** C. J. Rossi, DENTAL RESTORATIVE MATERIAL OF IMPROVED POLISHABILITY; **3,926,906,** Lee II, Smith and Swartz, DENTAL FILLING PACKAGE, **filed** Mar. 18, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV 76–890–F, *Pennwalt Corporation* v. *Johnson & Johnson and Lee Pharmaceuticals.*

3,792,531. (See 3,751,399.)

3,801,745, W. Zuckerman, TELEPHONE CALL DURATION TIMER; **3,909,535,** same, TELEPHONE COUPLER UNIT, **filed** Apr. 30, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV-76–1423–DWW, *Monitor Business Machines, Inc.* v. *American Telephone & Telegraph Co. et al.*

3,875,607, R. B. Rosseau, GUTTER BRUSH, **filed** Nov. 14, 1975, D.C., E.D. Wis. (Milwaukee) Doc. 75–C–669, *FMC Corp.* v. *Zarnoth Brush Works Inc.* **Same, filed** May 3, 1976, D.C., N.D. Ohio (Cleveland) Doc. C–76–439, *Jenkins Equipment Co.* v. *FMC Corporation.*

3,909,535. (See 3,801,745.)

3,926,906. (See 3,751,399.)

3,926,906, Lee II, Smith and Swartz, DENTAL FILLING PACKAGE, **filed** Mar. 8, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV 76–764–MML, *Minnesota Mining & Manufacturing Co.* v. *Johnson & Johnson, etc. et al.* **Same, filed** Mar. 19, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV 76–909–RF, *Lee Pharmaceuticals* v. *Johnson & Johnson.*

3,948,680, Mao and Sabation, LEAD-ACID STORAGE BATTERY CAPABLE OF ACTIVATION BY THE ADDITION OF ELECTROLYTE, **filed** May 6, 1976, D.C. Del. (Wilmington) Doc. 76–162, *General Battery* v. *Gould, Inc.*

D. 237,025, P. L. Null, FOOTSTOOL; **D. 237,028,** same, SEAT, **filed** Apr. 16, 1976, D.C., W.D.N.C. (Charlotte) Doc. C–C–76–132, *Null Manufacturing Corporation* v. *Crestline Furniture Company, Inc.* **Same, filed** Apr. 19, 1976, D.C., M.D.N.C. (Greensboro) Doc. C–76–182–G, *Null Manufacturing Corporation* v. *Abbott Industries, Inc. and Emerson Lounge Co., Inc.*

D. 237,028. (See D. 237,025.)

D. 237,228, B. H. Kaplan, FURNITURE SEAT; **D. 237,230,** same, CHAIR, **filed** Oct. 22, 1975, D.C., W.D.N.C. (Statesville) Doc. ST–C–75–45, *Rowe Furniture Corporation* v. *Image Furniture Company.* Final judgment, defendant is hereby permanently enjoined from infringing upon plaintiff's said design patents, Mar. 18, 1976. **Same, filed** Oct. 22, 1975, D.C., W.D.N.C. (Statesville) Doc. ST–C–75–46, *Rowe Furniture Corporation* v. *Southern Furniture Company of Conover, Inc.* Final judgment, defendant is hereby permanently enjoined from infringing upon plaintiff's said design patents, Mar. 18, 1976.

D. 237,230. (See D. 237,228.)

PATENT NOTICES

Certificates of Correction for the Week of Oct. 12, 1976

P.P. 3,915	3,941,733	3,961,138	3,968,533
D. 240,337	3,943,113	3,961,168	3,968,705
D. 240,640	3,943,399	3,961,220	3,968,881
3,665,079	3,943,806	3,961,437	3,968,886
3,666,461	3,944,003	3,961,876	3,968,912
3,734,873	3,944,305	3,962,237	3,968,965
3,744,313	3,947,927	3,962,298	3,969,178
3,746,653	3,948,893	3,962,389	3,969,275
3,751,635	3,949,371	3,962,808	3,969,793
3,765,874	3,949,372	3,962,891	3,970,307
3,769,217	3,949,853	3,962,920	3,970,675
3,835,754	3,950,087	3,963,559	3,970,883
3,850,682	3,950,268	3,963,733	3,970,964
3,873,878	3,950,353	3,963,879	3,971,005
3,887,547	3,951,954	3,963,919	3,971,178
3,887,768	3,953,286	3,963,929	3,971,441
3,897,106	3,954,907	3,964,004	3,971,674
3,898,748	3,955,328	3,964,310	3,971,781
3,903,193	3,955,755	3,964,758	3,972,084
3,907,615	3,955,820	3,965,034	3,972,110
3,911,402	3,955,910	3,965,102	3,972,592
3,913,072	3,955,985	3,965,220	3,972,852
3,915,891	3,956,224	3,965,386	3,972,945
3,916,182	3,956,415	3,965,518	3,973,028
3,916,988	3,956,498	3,965,639	3,973,161
3,920,765	3,956,517	3,966,013	3,973,322
3,925,761	3,956,856	3,966,458	3,973,941
3,926,987	3,958,111	3,966,579	3,974,008
3,927,137	3,959,067	3,966,829	3,974,075
3,928,766	3,959,100	3,966,903	3,974,114
3,930,872	3,959,367	3,966,946	3,974,444
3,930,980	3,959,451	3,967,070	3,974,751
3,931,173	3,959,627	3,967,313	3,974,891
3,931,182	3,960,375	3,967,337	3,974,902
3,935,809	3,960,480	3,967,900	3,974,980
3,937,378	3,960,520	3,967,949	3,977,054
3,937,744	3,960,855	3,968,278	3,981,915
3,938,615	3,960,941	3,968,378	

Disclaimers

3,437,820.—*Moody C. Thompson, Jr.* and *Lockett E. Wood*, Boulder, Colo. OPTICAL DISTANCE MEASURING EQUIPMENT UTILIZING TWO WAVELENGTHS OF LIGHT IN ORDER TO DETERMINE AND COMPENSATE FOR THE DENSITY OF THE AIR. Patent dated Apr. 8, 1969. Disclaimer filed Nov. 24, 1970, by the assignee, *United States of America as represented by the Secretary of Commerce.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,638,310.—*George K. Austin, Jr.*, Newberg, Oreg. DENTAL HANDPIECE CONTROL. Patent dated Feb. 1, 1972. Disclaimer filed Apr. 11, 1975, by the inventor.

Hereby enters this disclaimer to claims 17, 18 and 19 of said patent.

3,829,700.—*Robert A. Buchanan*, Palo Alto, Calif., *Melvin Tecotzky*, Mendham, N.J., and *Kenneth A. Wickersheim*, Palo Alto, Calif. RARE EARTH PHOSPHORS FOR X-RAY CONVERSION SCREENS. Patent dated Aug. 13, 1974. Disclaimer filed Sept. 1, 1976, by the assignee, *Lockheed Missiles & Space Company, Inc.*

The term of this patent subsequent to Apr. 2, 1990, has been disclaimed.

3,833,401.—*Alvin R. Ingram*, Murrysville, Pa. DEGRADABLE POLYETHYLENE FILM. Patent dated Sept. 3, 1974. Disclaimer filed July 23, 1976, by the assignee, *Arco Polymers, Inc.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

3,849,492.—*Heimo Brunetti*, Reinach, *Kurt Schwarzenbach*, Aesch, and *Andreas Schmidt*, Reinach, Switzerland. BIS-SALICYLOYL-HYDRAZINES. Patent dated Nov. 19, 1974. Disclaimer filed Dec. 10, 1975, by the assignee, *Ciba-Geigy Corporation.*

Hereby enters this disclaimer to claims 1 through 2 inclusive of said patent.

3,859,405.—*Robert A. Horton*, Chesterland, Ohio. METHODS OF MAKING MOLDED REFRACTORY ARTICLES. Patent dated Jan. 7, 1974. Disclaimer filed May 24, 1974, by the assignee, *Precision Metalsmiths, Inc.*

The term of this patent subsequent to Aug. 22, 1989, has been disclaimed.

3,946,358.—*Charles Donald Bateman*, Bellevue, Wash. AIRCRAFT GROUND PROXIMITY WARNING INSTRUMENT. Patent dated Mar. 23, 1976. Disclaimer filed Aug. 25, 1976, by the assignee, *Sundstrand Data Control, Inc.*

Hereby enters this disclaimer to claim 13 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 11, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-5-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Aso; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-6-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-3-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	12-29-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-21-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	11-10-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-4-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-12-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-11-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-2-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-12-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	3-2-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-29-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-11-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	2-5-76

Expiration of patents: The patents within the range of numbers indicated below expire during September 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,901,749 to 2,907,036, inclusive
Plant Patents..... Numbers 1,561 to 1,569, inclusive

REISSUES

OCTOBER 12, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

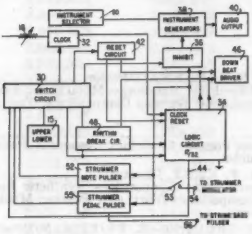
Re. 28,999
AUTOMATIC RHYTHM SYSTEM PROVIDING DRUM BREAK

James S. Southard, Union, Mich., assignor to C. G. Conn, Ltd., Oak Brook, Ill.

Original No. 3,764,722, dated Oct. 9, 1973, Ser. No. 263,474, June 16, 1972. Application for reissue Oct. 6, 1975, Ser. No. 620,127

Int. Cl.[2] G10H *1/00*

U.S. Cl. 84—1.03 **27 Claims**



26. An automatic rhythm system, including in combination, memory means having a plurality of selectively enabled sections for storing rhythm patterns with one of said sections storing a special rhythm pattern, each of said sections having selectively enabled output means;

scanning means connected to said sections of said memory means for reading out said patterns as pulse trains to said output means in response to the application of clock pulses thereto;

clock means for applying clock pulses to said scanning means; and

switch means including a plurality of rhythm selector switches, a rhythm break switch and circuit means controlled by said switches and connected to said scanning means and to said output means of said memory sections, said rhythm selector switches being operative to cause said circuit means to selectively enable said output means of predetermined sections of said memory means, said circuit means having a portion connected to said rhythm break switch and rendered operative thereby in response to operation of said rhythm break switch to enable said one section of said memory means to produce the special rhythm pattern.

Re. 29,000
HYDRAULIC ACTUATOR

Richard J. Ifield, and William R. Ifield, both of Dural, Australia, assignors to R. J. Ifield & Sons Pty. Limited, Dural, Australia

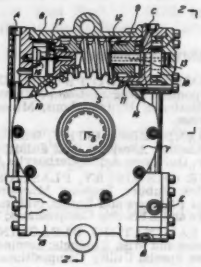
Original No. 3,703,851, dated Nov. 28, 1972, Ser. No. 101,089, Dec. 23, 1970. Application for reissue Mar. 21, 1974, Ser. No. 453,506

Claims priority, application Australia, Jan. 6, 1970, 18/70

Int. Cl.[2] F01B *1/08*; **F01L** *15/00, 33/00*; **F16H** *19/04*

U.S. Cl. 91—174 **2 Claims**

6. A linear actuator comprising a body structure having a first and a second end and defining a first cylinder and a second cylinder; a first annular piston disposed in said first cylinder and a second annular piston disposed in said second cylinder; a first duct means for continuously communicating a first chamber defined by said first end and said first piston with a relatively high pressure source; a second duct means for continuously communicating a second chamber defined by said second end and second piston with a relatively low pressure source; changeover valve means controlling the admission and exhaust of relatively high pressure fluid to and from a third chamber defined between said first and second pistons in a manner causing said pistons to reciprocate through power and return strokes with the power stroke of one piston alternating with that of the other and with substantially no time delay between successive power strokes; a shaft extending co-axially through said pistons in threaded engagement therewith, means for preventing



rotation of the shaft and motor means connected to rotate each piston during its return stroke so that upon admitting high pressure to said third chamber said second piston causes axial movement of the shaft in the direction of the second end and the motor means rotates the first piston such as to cause its movement relative to the shaft and the body structure in the direction of the first end, while upon venting said third chamber, said first piston causes axial movement of the shaft in the direction of the second end and the motor means rotates the second piston such as to cause its movement relative to the shaft and the body structure in the direction of the first end.

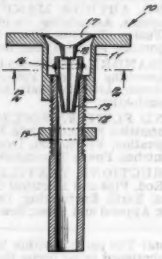
Re. 29,001
CIGARETTE SNUFFING DEVICE FOR VEHICLES

Milton Foote, 831 S. Water St., Silverton, Oreg. 97381

Original No. 3,782,394, dated Jan. 1, 1974, Ser. No. 249,188, May 1, 1972. Application for reissue Mar. 6, 1975, Ser. No. 556,133

Int. Cl.[2] A24F *13/18*

U.S. Cl. 131—256 **2 Claims**



2. A snuffing device comprising a hollow mounting member, a tapered and split tube adapted to receive a cigarette butt to be snuffed therein, an outwardly projecting shoulder intermediate

the ends of the split tube, the hollow mounting member receiving the split tube and supporting the latter by said shoulder in a substantially vertical position, resilient means engaging the split tube for resiliently resisting expansion of the lower portion of the split elements of the tube, whereby a butt may be retained therein and discharged downwardly therefrom after being snuffed, a concave guide member mounted above the split tube and having a central aperture registering with the upper end of said split tube, whereby inserting a butt downwardly through said central aperture and into the split tube will cause the split tube elements to expand against the resilient resistance of said resilient means, thereby causing the snuffing of said butt and whereby the insertion of a succeeding butt therein in a like manner will cause the first butt to be discharged downwardly therefrom and also the snuffing of said succeeding butt.

Re. 29,002

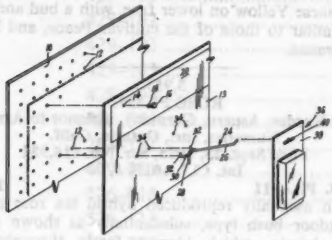
MERCHANDISING DISPLAY ASSEMBLY

James A. Govang, Clinton, Conn., assignor to The Stanley Works, New Britain, Conn.

Original No. 3,799,357, dated Mar. 26, 1974, Ser. No. 261,800, June 12, 1972. Application for reissue Mar. 14, 1975, Ser. No. 558,308

Int. Cl.² A47F 7/00

U.S. Cl. 211—59 **5 Claims**



1. In a merchandising display assembly, the combination comprising: a substantially rigid mounting board having a multiplicity of *substantially identically configured and dimensioned* mounting [recesses] *holes evenly* distributed over one surface thereof in a predetermined *regular* pattern, *said holes comprising substantially entirely the apertures in said mounting board*; at least one *sheet-like* display panel relatively thin with respect to said mounting board and having a plurality of apertures therethrough aligned with a cooperating plurality of said [recesses] *holes* of said mounting board, [said] *the* outer surface of said display panel having a plurality of discrete areas of product identifying indicia thereon; securing means disengageably securing said display panel upon one surface of said mounting board with said apertures and mounting [recesses] *holes* thereof aligned, *said securing means comprising at least two fasteners extending through spaced apertures in said display panel and disengageably seated in some of said holes of said mounting board in registry therewith*; and a plurality of [merchandise support members] *hangers of rigid, wire-like construction* having engagement portions extending through said apertures and disengageably seated in aligned [recesses] *holes* of said mounting [boards] *board, said engagement portions projecting radially from said aligned holes* and thereby mounting and supporting said [support members] *hangers* on said mounting board, said [support members] *hangers* having *elongated hook elements providing* support portions extending outwardly from said one surface of said mounting board and of the outer surface of said display panel for the support of articles of merchandise thereadjacent with said display panel interposed therebetween.

Re. 29,003

(R)-1-(2-FUROYLOXY)-3-METHYLBUTYL-PENICILLIN

Andre Furlenmeier, Basel; Paul Lanz, Muttenz; Peter Quitt, Fullinsdorf all of Switzerland; Karl Vogler, deceased, late of Riehen, Switzerland; by Heinrich Vogler, heir at Law, Basel; by Niklaus Eduard Vogler, heir at Law, Riehen, both of Switzerland, and by Franziska Elisabeth Vogler, heir at Law, Bochum-Stiepel, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

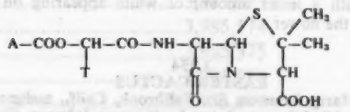
Original No. 3,839,322, dated Oct. 1, 1974, Ser. No. 215,187, Jan. 3, 1972. Application for reissue Oct. 2, 1975, Ser. No. 619,128

Claims priority, application Switzerland, Jan. 20, 1971, 848/71

Int. Cl.² C07D 99/16

U.S. Cl. 260—239.1 **2 Claims**

1. A compound of the formula



wherein A is selected from the group consisting of furyl, tetrahydrofuryl and thienyl, and T is selected from the group consisting of C_3–C_5 *alkyl*, C_3–C_5 alkenyl, cyclopropylmethyl, cyclobutylmethyl and cyclopentyl and pharmaceutically acceptable salts and hydrated forms thereof.

Re. 29,004

DEACTIVATING AND REMOVING ALUMINUM AND TITANIUM CONTAMINANT FROM ZIEGLER-NATTA POLYMERIZATION MIXTURES

Barrett L. Cupples, Franklin Township, Westmoreland County, Pa.; Thomas J. Lynch, Orange, Tex., and Clarence R. Murphy, Allison Park, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Original No. 3,876,600, dated Apr. 8, 1975, Ser. No. 427,083, Dec. 21, 1973. Application for reissue Dec. 12, 1975, Ser. No. 640,248

Int. Cl.³ C08F 1/88; 1/52

U.S. Cl. 528—485 **10 Claims**

1. A method for the deactivation and separation of residual catalyst from a solution containing a liquid poly(1-alkene) which is the reaction product of the polymerization of a 1-alkene having from five to 20 carbon atoms in a hydrocarbon polymerization solvent in the presence of a catalytic amount of an organoaluminum compound and a titanium compound which comprises the steps of adding a minor amount of a flux-calcined diatomite to the poly(1-alkene) polymerization solution and filtering out the flux-calcined diatomite and the insolubilized catalyst metals from the liquid poly(1-alkene) solution.

PLANT PATENTS

GRANTED OCTOBER 12, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,953
GREVILLEA PLANT AROMAS

Joseph Solomone, P.O. Box 1307, Watsonville, Calif. 95076

Filed Feb. 28, 1975, Ser. No. 554,234
Int. Cl.² A01H *5/02*
U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct variety of Grevillea as herein shown and described, characterized particularly as to novelty by the unique combination of a large and full stature, long slightly arched branches forming oblique angles with the ground, dense and bristly foliage with the leaves stiffer than usually encountered, the inflorescences very full, with profuse blooming over a long period of time, and the blossoms a very distinctive and deep red color, with a lesser amount of white appearing on the calyx of the flower.

3,954
EASTER CACTUS

Joseph Harry Johnson, Sr., Fallbrook, Calif., assignor to Ethan M. Johnson, doing business as Johnson Cactus Gardens, Fallbrook, Calif.

Filed Mar. 17, 1975, Ser. No. 558,707
Int. Cl.² A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of Easter cactus substantially as shown and described, characterized by the Tyrian Pink color of its blooms, by its upright habit, and by its free flowering propensity.

3,955
CHRYSANTHEMUM PLANT

John Robert Culbert, Monticello, Ill., assignor to University of Illinois Foundation, Urbana, Ill.

Filed July 21, 1975, Ser. No. 597,407
Int. Cl.² A01H *5/00*
U.S. Cl. Plt.—81 **1 Claim**

1. A new and distinct cultivar of chrysanthemum plant substantially as herein shown and described, characterized particularly as to novelty by decorative type flowers of strong reddish purple color that resist fading to a remarkable degree even when exposed to extremely high temperatures and which open slowly and retain their form over a long time extending the useful "shelf life," by flower buds which develop normally in approximately 9 weeks from start of initiation without delay or stall even when grown under extremely high temperatures, and by strong plants which average 4 to 5 breaks per pinched plant making a showy display of the 4½" to 5" flowers.

3,956
ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Sept. 18, 1975, Ser. No. 614,504
Int. Cl.² A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct cultivar of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its vigorous, well branched growth, its bicolored flowers of mottled Carmine on upper face and Chinese Yellow on lower face, with a bud and flower form similar to those of the cultivar Peace, and little or no fragrance.

3,957
ROSE PLANT

Reimer Kordes, Aspern, Germany, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Sept. 23, 1975, Ser. No. 615,981
Int. Cl.² A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. An asexually reproduced hybrid tea rose plant of the outdoor bush type, substantially as shown and described herein, which blooms freely throughout the season and has a sturdy habit of growth, stiff erect peduncles having numerous stipitate glands, having several large and a few small prickles on stems and branches, and possessing glossy foliage which is relatively more resistive to mildew than comparable varieties grown under equivalent conditions; the plant being especially characterized by the coloration of its bloom, with flower petals ranging from golden yellow tipped with red in the bud stage, opening to double-shaded petals golden without and apricot within, the inner faces of petals often being blushed red when the plant is grown outdoors, and at the end of blooming manifesting a lighter shade of the same coloration; the bloom also being characterized as to its configuration by the presence of 65 to 75 petals with 20 to 50 petaloids, and also 140 pistils, and styles and stamen-filaments being devoid of visible red pigments.

PATENTS

GRANTED OCTOBER 12, 1976

ERRATA

For CLASS	See PATENT NO.
179–156 R	3,984,885
029–195	3,984,907
070–267	3,985,023
081–091 R	3,985,050
114–091	3,985,106
239–185	3,985,161
211–007	3,985,183
197–001 R	3,985,216
235–061.12 N	3,985,293
429–133	3,985,573
429–162	3,985,574
429–103	3,985,575
429–103	3,985,576
429–194	3,985,577
429–044	3,985,578
264–121	3,985,580
429–051	3,985,581
526–015	3,985,715
526–113	3,985,718
526–220	3,985,720
526–084	3,985,721
536–017	3,985,727
536–120	3,985,728
235–078 R	3,986,002
235–096	3,986,005
307–304	3,986,195

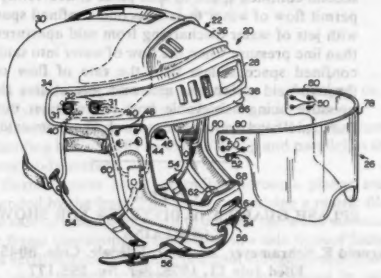
PATENTS

GRANTED OCTOBER 12, 1976

NOTE—Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

3,984,875
PROTECTIVE HEAD GEAR
Charles R. Farquharson, Toronto, Canada, assignor to Canada Cycle and Motor Company Limited, Weston, Canada
Filed Aug. 28, 1975, Ser. No. 606,391
Claims priority, application Canada, July 18, 1975, 231816
Int. Cl.² A41D *13/00*
U.S. Cl. 2—10 **10 Claims**



1. Protective head gear of a type used in hockey and other activities to protect a participant against harmful and damaging impacts, the protective head gear comprising:

a helmet adapted to cover major portions of the participant's head other than his face, the helmet having symmetrically disposed temple portions at either side of the helmet, and a peripheral brow portion extending between the temple portions, the brow portion being normally positioned in use to extend across the participant's brow above the eyes;

a mouth guard comprising: a front portion for protecting a user's mouth; and a pair of wing portions extending from the front portion symmetrically rearwards and upwardly, said wing portions being attached to the temple portions, the front portion and wing portions defining an upper peripheral portion aligned generally vertically with said peripheral brow portion when in use; and

an eye shield attachable to the temple portions and curved symmetrically outwards, at least major portions of the respective upper and lower peripheries of the eye shield overlying the peripheral brow portion of the helmet and the upper peripheral portion of the mouth guard during use so that on impact the eye shield will be supported by one or more of these portions.

3,984,876
ARTICLE OF CLOTHING
Evelyn L. Sutton, 13521 Grandmont, Detroit, Mich. 48227
Filed Jan. 16, 1975, Ser. No. 541,519
Int. Cl.² A41B *13/10*
U.S. Cl. 2—48 **7 Claims**

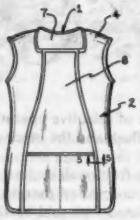
1. An article of clothing comprising in combination:

a main body member having a back section and two front sections of substantially equal dimensions defining a shoulder portion and a neck opening;

said two front sections define a longitudinal void which extends from said neck opening to the bottom edge of said main body member;

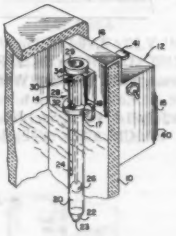
a removable and interchangeable protective member; and

fastening means which removably affixes said interchangeable protective member to said two front sections of said



main body member so as to substantially cover said longitudinal void.

3,984,877
FLUSH TANK WARNING SYSTEM
James D. Kirby, 11742 Highwood, Palos Park, Ill. 60464
Filed Oct. 9, 1975, Ser. No. 621,118
Int. Cl.² A47K *17/00*
U.S. Cl. 4—1 **8 Claims**



1. In a receptacle for storing fluid wherein fluid may be emptied and filled to alternately lower and raise the fluid level in the receptacle, a fluid level monitor comprising:

a control tube;

said control tube having inlet means to admit fluid to the tube as fluid level in the receptacle rises and having outlet means to drain fluid from the control tube;

said outlet means including fluid metering means for lowering a level of fluid within the control tube at a rate slower than the rate of fluid emptying from the receptacle;

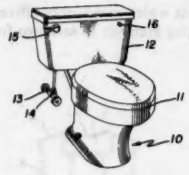
means for sensing a lowered fluid level in the control tube and including means fixedly mounted with respect to the control tube with means responsive to a lowered fluid level inside the control tube; and,

signal means actuated by the means for sensing a lowered fluid level in the control tube to indicate when fluid has metered from the control tube before the control tube is filled with water as the receptacle is filled.

3,984,878
WATER CLOSET

John J. Grasseschi, 1 Derby St., Worcester, Mass. 01604

Filed Sept. 25, 1975, Ser. No. 617,495
Int. Cl.² E03D 1/22, 1/30, 3/00, 3/12
U.S. Cl. 4—34 10 Claims



1. A toilet capable of selective operation in two modes, one of which is a partial flush and the other of which is a full flush, comprising

a. a bowl having a front wall and an oppositely facing rear wall and a tank connected thereto,

b. an S-trap associated with said bowl and adjacent the rear wall of the bowl, said S-trap comprising an upwardly extending part enabling a reserve of water to be maintained in said bowl, a weir limiting the amount of reserve water, and a downstream leg which, when flooded, causes the reserve of water to be exhausted from the bowl,

c. a transition port connecting the bottom of the bowl to the S-trap,

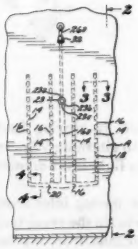
d. a first nozzle positioned a substantial distance up the front wall, the nozzle being connected to a source of high-pressure water and aimed at and adapted to direct a high-pressure stream of water at the transition port, and

e. a control valve system for use in the full flush mode and adapted to cause the nozzle to direct the stream at the transition port for a fixed period of time subsequent to actuation of the valve system.

3,984,879
BODY STALL SHOWER STRUCTURE

Olgierd Z. Ejchorszt, 5580 Vesuvian Walk, Long Beach, Calif. 90803

Filed July 14, 1975, Ser. No. 595,380
Int. Cl.² A47K 3/22, 3/08
U.S. Cl. 4—145 4 Claims



1. A preformed body stall shower structure that includes:

a. a vertically disposable panel formed from a water resistant material that has a plurality of laterally spaced, longitudinally extending rows of apertures therein said panel having forward and rearward sides and capable of defining at least a portion of a stall shower;

b. a plurality of conduits of semi-circular transverse cross section that are bonded to said rearward side ends, with a portion of said conduits being longitudinally disposed and cooperating with said rearward side to define a plurality of longitudinally extending first confined spaces, and at least one of said conduits being transversely disposed and defining a second confined space in communication with said first confined spaces;

c. a manually operable position valve having an inlet and at least first and second outlets, said valve supported from said panel;

d. a shower head;

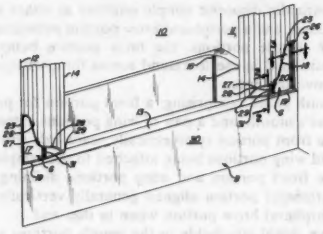
e. a first pipe connected to said first outlet and supporting head at an elevated position adjacent said forward side of said panel; and

f. a second pipe connected to said second outlet and to said second confined space, with said multi-position valve selectively permitting the flow of water through said valve to be obstructed, to permit flow of water to said head alone, to permit flow of water to said head and to said second confined space to take place concurrently, and to permit flow of water to said second confined space only, with jets of water discharging from said apertures at less than line pressure when the flow of water into said second confined space is less than the rate of flow of water through said apertures, and said jets at less than line pressure being achievable both when water discharges from said head and does not discharge from said head.

3,984,880
SPLASH GUARD AND DIVERTER FOR SHOWER CURTAINS

Arnold F. Schrameyer, Box 157, Idledale, Colo. 80453

Filed July 11, 1975, Ser. No. 595,177
Int. Cl.² A47K 3/22
U.S. Cl. 4—146 9 Claims



1. A splash guard for a bathtub installed in a recess having a wall abutting the inner side and each end of the tub, said tub having an outer rim having a top, and a shower facility extending from one of said walls, said splash guard comprising:

a first footing constructed and arranged to extend along said tub rim in a direction away from the corresponding end wall;

a second footing constructed and arranged to extend upwardly along said end wall from said tub rim;

a web connecting said footings and having an upper edge constructed and arranged to slope generally downwardly to said tub rim; and

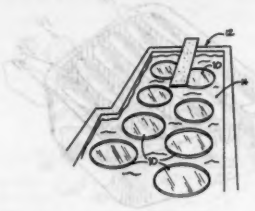
said splash guard being adapted to be installed with the portion thereof adjacent said end wall being spaced outwardly from the inner edge of said tub rim and having an offset whereby the opposite end thereof extends to a point closely adjacent the inside edge of said rim.

3,984,881

SOLAR PANEL

Richard K. Gerlach, Rolling Hills Estates, Calif., assignor to CaTel Manufacturing Inc., Monrovia, Calif.

Filed Dec. 19, 1974, Ser. No. 534,368
Int. Cl.² E04H 3/16, 3/18
U.S. Cl. 4—172 16 Claims



1. In a solar panel assembly adapted to be deployed on a water body surface and to move about on said surface,

a. a frame in the form of a semi-rigid plastic loop, the frame extending horizontally to extend along and parallel to the water body surface,

b. a flexible cover sheet extending across a planar area bounded by the frame, the sheet comprising a plastic film one side of which is adapted to contact the water surface,

c. the frame containing a recess sunk in a side thereof facing in a vertical direction, there being an elongated spline and the sheet having a peripheral portion secured in said recess by said spline,

d. the space above and below said cover sheet being entirely open, vertically, and

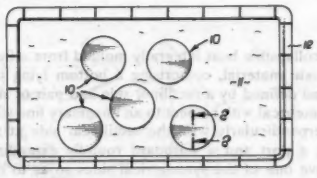
e. the frame having walls bounding and forming a hollow extending lengthwise internally of the frame, the hollow spaced vertically from said recess and entirely separated therefrom, there being frame walls projecting vertically to form said recess therebetween.

3,984,882

PANEL STRUCTURE FOR USE ON WATER BODIES

Christopher S. Forman, Arcadia, and Richard K. Gerlach, Rolling Hills Estates, both of Calif., assignors to CaTel Manufacturing Inc., Monrovia, Calif.

Filed Aug. 25, 1975, Ser. No. 607,446
Int. Cl.² E04H 3/16, 3/18
U.S. Cl. 4—172 13 Claims



1. In a panel unit to be deployed on a body of water to alter heat transfer to or from the water or to block evaporation,

a. a loop-shaped plastic frame, bounding an open zone, the frame having a channel section,

b. a plastic sheet extending across said zone, and

c. insert means retained in said channel section and holding said sheet to the frame,

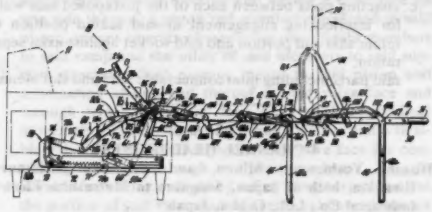
d. said sheet having woven construction and there being air filled interstices distributed over the sheet area across said zone to load with water in response to sheet contact with the water.

3,984,883

PULL OUT SOFA BED AND HARDWARE THEREFOR

John Wong, Jersey City, N.J., assignor to Mohasco Corporation, Amsterdam, N.Y.

Filed Apr. 17, 1975, Ser. No. 568,729
Int. Cl.² A47C 17/14
U.S. Cl. 5—13 33 Claims



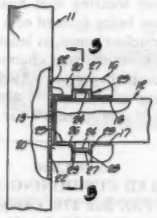
1. A folding pull out sofa bed comprising a rear head section, an intermediate section and means to pivot the front end of said head section to the rear end of said intermediate section, said head section extending rearwardly of said intermediate section in the open, sleeping position of said bed, and means to permit said head section to swing about said pivot means, from said rearwardly extending position to a position extending forwardly and overlying said intermediate section, and said means to permit said head section to swing about said pivot, comprising means to releasably lock said head section in an upwardly and rearwardly inclined T.V. position as a predetermined angle, said head section being swingable to said position extending forwardly and overlying said intermediate section when said releasably lock means is released, said releasably lock means including means to alternately lock and release said head section upon raising said head section from said rearwardly extending position through a greater angle than said predetermined angle, and then lowering said head section, a plurality of consecutive times.

3,984,884

BED FRAME HAVING RELEASABLY INTERLOCKED SIDE RAILS AND CROSSBARS

Melvin P. Spitz, 619 N. Elm Dr., Beverly Hills, Calif. 90210

Continuation-in-part of Ser. No. 556,914, March 10, 1975. This application May 14, 1975, Ser. No. 577,172
Int. Cl.² A47C 23/06
U.S. Cl. 5—176 R 18 Claims



1. In a bed frame having a pair of side rails and at least one end crossbar interconnected to provide a supporting frame structure for an associated box spring, the improvement in which an end of the crossbar is releasably connected with a side rail by means, comprising:

a. a bracket secured to the side rail, said bracket having walls coacting to form a socket for receiving an end portion of the connected crossbar into a seated position therein,

said socket having a longitudinal axis extending parallel to the axis of the end portion of said crossbar seated therein, and

said walls including spaced apart side walls lying on opposite sides of said axis;

b. said end portion of said crossbar having spaced apart side walls lying on opposite sides of its longitudinal axis,

said side walls of said crossbar in said seated position being respectively juxtaposed to said side walls of said socket; and

c. coacting parts between each of the juxtaposed side walls for interlocking engagement in said seated position to retain said end portion and said socket against axial separation,

said parts including interconnectable stud and slot means.

3,984,885

4-CHANNEL HEADPHONES

Hisashi Yoshimura, Minoo, and Yasutake Nishimura, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 4, 1975, Ser. No. 555,093

Claims priority, application Japan, Mar. 15, 1974, 49-30357; Mar. 20, 1974, 49-32032

Int. Cl.² H04M *1/05*; H04R *5/02*

U.S. Cl. 179—156 R **5 Claims**

1. Four-channel headphones comprising a head band and right and left subsystems connected by said head band, each of said subsystems including:

a casing;

a baffle board having a plurality of apertures therein, said casing and said baffle board defining an enclosure;

at least two spaced driver units for reproducing front and rear channel signals secured within said enclosure to the back surface of said baffle board; and

sound insulating means attached to the front surface of said baffle board between said driver units and adjacent the ear of a listener wearing said headphones, said sound insulating means being formed of a foam material which transmits low-pitched tones, at least the high range components of the front and rear channel signals reproduced by said driver units being prevented from mixing by said sound insulating material until the sound reaches the auditory canal of said listener's ear.

3,984,886

FLUID-FILLED CUSHIONING ASSEMBLIES

J. Herbert Keeton, P.O. Box 278, Campbellsville, Ky. 42718

Filed Aug. 20, 1975, Ser. No. 606,079

Int. Cl.² A47C *27/08*

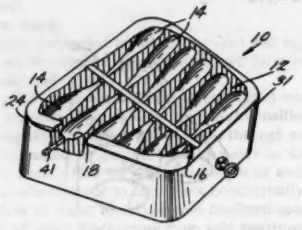
U.S. Cl. 5—368 **5 Claims**

1. A cushioning assembly comprising

a. a body member formed of resilient material,

b. a plurality of individual substantially fluid-tight, fluid-filled cells disposed within said body, and

c. means for selectively sealing off said cells from one another so that no free flow of fluid therebetween is possible, or for providing free communication between said cells so that free flow of fluid therebetween takes place, said selective sealing means comprising a common passageway communicating with each of said individual cells, each of said cells having an entrance into said passageway, and an elastic elongated three-dimensional body located within and extending along said passageway, said body having a first, expanded, position thereof filling the passageway so that the entrances to a plurality of said



cells are blocked off thereby, and a second, contracted, position thereof not completely filling the passageway so that free communication is provided between said cells through said passageway.

3,984,887

PORTABLE COLLAPSIBLE BOAT

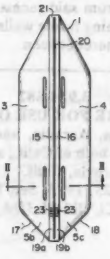
Keigo Tanemoto, 118, 12-1, Nishihogima 4-chome, Adachi, Tokyo, Japan

Filed July 17, 1975, Ser. No. 596,822

Claims priority, application Japan, July 23, 1974, 49-84392

Int. Cl.² B63B *7/00*

U.S. Cl. 9—2 C **3 Claims**



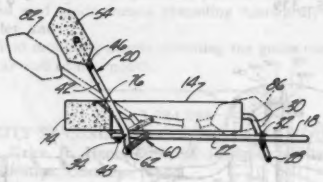
1. A collapsible boat integrally molded from a flexible synthetic resin material, comprising a bottom lying in a single plane and defined by a rectiliner side and pair of sides which are symmetrical with respect to an imaginary line which intersects perpendicularly with the rectilinear side at the center thereof; a port and a starboard roundly extending from a respective one of the symmetrical sides so as to overlie the bottom and having their terminal edges disposed opposite to each other and on the opposite sides of the imaginary line; a stern including a first portion in the form of an equilaterial triangle having the rectilinear side as its base and extending therefrom in the same plane as the bottom and a second and third portion roundly extending from each isosceles side of the triangle so as to overlie the first portion and integrally connected with the port and the starboard, respectively, with their terminal edges disposed opposite to each other and on the opposite sides of the imaginary line; and concertina connections provided intermediate said port and said stern, and said starboard and said stern in order to facilitate the folding operation when the boat is set up.

3,984,888

ADJUSTABLE FLOATING CHAIR

Arthur D. DeLano, Battle Creek, Mich., assignor to D & J Products, Battle Creek, Mich.

Filed May 21, 1975, Ser. No. 579,431
Int. Cl.² B63C 9/08
U.S. Cl. 9—347 8 Claims



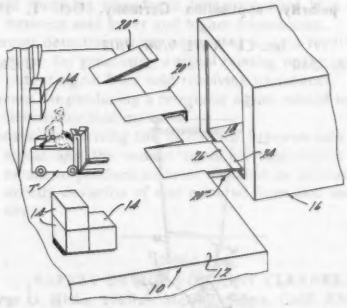
1. A floating, reclining chair comprising; a pair of parallel spaced float members, a seat member disposed between said float members and being connected thereto for angular movement relative to said float members between a first position in which said seat member is substantially parallel to said float members and a second position in which said seat member is disposed at an angle to said float members, a backrest member pivoted to said seat member for adjustable movement relative thereto between a first position in which the backrest member is at an angle to said seat member when said seat member is in it first position to accommodate a seated occupant, to a second position in which said backrest member is disposed parallel to said seat member and said seat member is at an angle to said float members to accommodate a reclining occupant, bracket means acting between said seat member and backrest member to maintain said members in selected positions relative to each other, and a support member disposed transversely between and connected to said float members and engageable with said backrest member to support the backrest member for all positions between said first and second positions of said backrest member.

3,984,889

LOADING DOCK SUPPORT

Steven Blomgren, Monroe, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.

Continuation of Ser. No. 460,689, April 15, 1974, abandoned, which is a continuation of Ser. No. 245,171, April 18, 1972, abandoned. This application Jan. 2, 1976, Ser. No. 646,072
Int. Cl.² B65G 11/00
U.S. Cl. 14—71.7 7 Claims



1. In an adjustable dock board of the type including a ramp with front and rear edges, with the rear edge hingedly connected to an associated support structure so that the ramp may swing up and down between a relatively lowered position and a relatively elevated position, the improvement which comprises,

a fluid operated support assembly for operatively supporting said ramp,

said assembly comprising a cylinder member containing a quantity of operating fluid, a piston reciprocably disposed within said cylinder member and having a valve face on one side thereof, a piston rod member connected to said piston, means operatively securing one of said members to said ramp and the other of said members to said support structure, fluid passage means in said piston and terminating at one end thereof at said valve face and through which fluid may flow to control longitudinal movement of said piston within said cylinder and a flexible valve disc disposed adjacent said valve face for controlling fluid flow through said passage means,

said valve face being defined by a first imaginary plane and the portion of said valve disc adjacent said passage means being defined by a second imaginary plane arranged at a preselected angle to said first imaginary plane, said valve disc being movable between a first position lying along said second plane permitting fluid flow through said passage means and a second position lying along said first plane preventing fluid flow through said passage means,

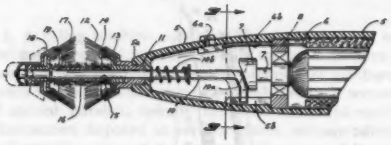
said valve element normally disposed in said first position when said ramp is substantially unloaded and when a load less than a load of predetermined magnitude is applied to said ramp so that fluid may flow through said passage means, with said valve element being movable toward said second position when a load substantially equal to or in excess of said predetermined magnitude is applied to said ramp so as to prevent fluid flow through said passage means, whereby said ramp may be moved between said relatively lowered and elevated positions when said ramp is unloaded or when a load applied to said ramp is of a magnitude less than said predetermined magnitude, but said ramp will remain substantially unmoved toward either said lowered or elevated positions when a load in excess of said predetermined magnitude is applied to said ramp.

3,984,890

ELECTRIC TOOTH BRUSH

George C. Collis, 313 W. 48th St., Minneapolis, Minn. 55409

Filed June 25, 1975, Ser. No. 590,399
Int. Cl.² A46B 13/02
U.S. Cl. 15—22 R 3 Claims



1. An electro-mechanically reciprocated tooth brush comprising,

a casing,

an electric motor housed within said casing,

a reciprocating rod slidably mounted at one end of casing for back and forth movement therein,

means associated with said electric motor and said casing for producing back and forth reciprocation of said rod when said motor is energized,

stationary bristles concentrically surrounding the axis of said rod in radially outwardly spaced relation thereto and mounted in fixed relation to said end of said casing,

reciprocating bristles fixed to said rod in generally opposed relation to said stationary bristles for back and forth movement relative to said stationary bristles to simulta-

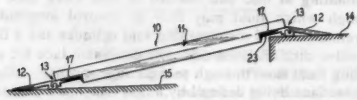
neously brush the inner and outer surfaces of the teeth positioned between said stationary and reciprocating bristles.

3,984,891

PORTABLE RAMP

Carl E. Weinmann, Lake City, Minn., assignor to Valley Craft Products, Inc., Lake City, Minn.

Filed Nov. 12, 1974, Ser. No. 518,726
Int. Cl.[2] E01D 15/12
U.S. Cl. 14—69.5 8 Claims



1. A portable ramp for spanning a space between two surfaces, comprising:

a. a span for extending across said space and having an upper side for supporting traffic engageable therewith, said span having means at each of its opposite ends defining a transverse cylindrical recess with a downwardly directed rectangular slot; and

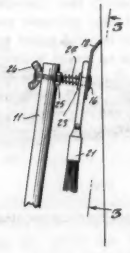
b. a pair of feet each having lower side means for respectively engaging the two surfaces and each having a sloping upper side engageable with the traffic and extending from said upper side of said span toward said two surfaces, said feet each having a cylindrical portion pivotally trapped in one of the recesses and having an integral connection with each foot respectively at the lowermost part of said cylindrical portions and disposed in said downwardly directed rectangular slots, said integral connections and said downwardly directed rectangular slots being constructed to enable the sloping upper sides of said feet to pivot to both sides of the plane of said upper side of said span.

3,984,892

BRUSH AND SCRAPER HOLDER

George S. Kyriakou, 43-43 91st Place, Elmhurst, N.Y. 11373

Filed Nov. 17, 1975, Ser. No. 632,262
Int. Cl.[2] A46B 17/08; B25G 3/38; B44D 3/16
U.S. Cl. 15—111 2 Claims



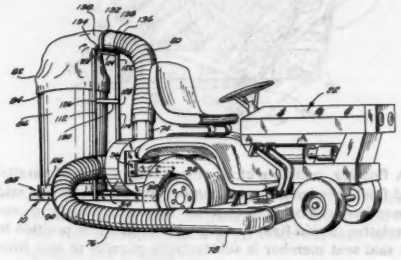
1. In a brush and scraper implement, the combination of an elongated handle, a paint scraper and a brush, and means for adjustably mounting said scraper and brush at one end of said handle, said means comprises a transverse opening through said handle end, a carriage bolt having a polygonal shoulder adjacent an enlarged head being fitted first through a correspondingly polygonal opening of a scraper blade and brush handle of a brush, and then through a washer, a compression coil spring, a threaded nut, said handle transverse opening and a wing nut, the bolt threadedly engaging the nuts, and the scraper and brush being adjustable to different angular positions on the shoulder.

3,984,893

VACUUM SWEEPER DEVICE

Marion L. Ashley, 3784 Exchange Ave., Naples, Fla. 33940

Filed Apr. 22, 1975, Ser. No. 570,440
Int. Cl.[2] A47L 9/00
U.S. Cl. 15—339 9 Claims



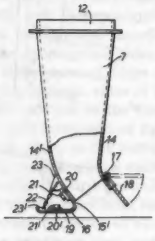
1. A vacuum sweeper device for a tractor having a power-take-off and including a rotary mower assembly, said vacuum sweeper device, comprising a support frame, attachment means for rigidly securing said support frame to said tractor, a vacuum blower attached to said support frame and having an inlet port, a discharge port, and a drive shaft, a container frame secured to said support frame, container means removably mounted on said container frame, inlet hose means leading to said inlet port of said vacuum blower, discharge hose leading from said discharge port of said vacuum blower to said container means, said support frame being positioned to locate the attached vacuum blower with its drive shaft in axial alignment with said power-take-off, and driving connection means connected to said power-take-off of said tractor and to said drive shaft of said vacuum blower for driving said vacuum blower while said rotary mower assembly is operating.

3,984,894

SWEEPING VEHICLES FOR SWEEPING ROADS AND OTHER SURFACES

Albert Brock, Schafereiweg 11, 3007 Gehrden; Karl-Heinz Splisteser, Gaussstrasse 19, 3000 Hannover, and Werner Dobbrunz, Ihmestrasse 117, 3005 Hemmingen, all of Germany

Filed Apr. 15, 1975, Ser. No. 568,178
Claims priority, application Germany, Oct. 1, 1974, 2446728
Int. Cl.[2] A47L 9/00, 9/02
U.S. Cl. 15—340 2 Claims



1. In a sweeping vehicle,

a sweeping and collecting assembly, said assembly comprising

means defining a suction mouth having a front wall and a rear wall, said mouth having an inlet facing in the direction of travel of the vehicle and being inclined at an acute angle with respect to the surface to be swept,

air guide means located behind the inlet with respect to the direction of travel of the vehicle, said guide means being arranged to extend generally parallel to the said surface, and said guide means extending rearwardly from said inlet, and

resilient mounting means mounting the guide means on the rear wall of the mouth.

3,984,895

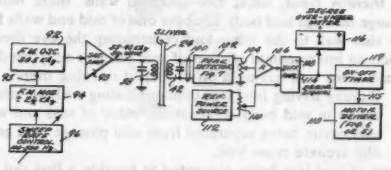
DENSITY SENSING AND CONTROLLING EQUIPMENT

Karl R. Grice, Jr., Honea Path, S.C., assignor to Fiber Controls Corporation, Gastonia, N.C.

Continuation of Ser. No. 411,841, Nov. 1, 1973, abandoned. This application Dec. 20, 1974, Ser. No. 534,808

Int. Cl.[2] G01N *9/24*; D01H *5/38*

U.S. Cl. 19—240 **18 Claims**



1. Apparatus for sensing the relative density of material which is in rod-like form, comprising:

tube shaped means forming a throughput aperture for receiving said material,

means for drawing said material through said aperture constantly in said rod-like form,

transmitting means including a transmitting transducer disposed on one side of said tube means and exposed to said throughput aperture for transmitting into said material a compression wave in the sonic ultrasonic frequency range,

a receiving transducer exposed to said throughput aperture for receiving the part of said wave that passes through said material,

said transmitting means including means for generating and delivering to said transmitting transducer a frequency modulated signal which sweeps between higher and lower frequencies through a predetermined center frequency at a given rate,

said receiving transducer being resonant at a frequency between said lower and higher frequencies,

circuit detecting means connected to said receiving transducer for generating a signal relating to the peaks of the output signal from said receiving transducer,

means for producing a reference signal related to a desired density for said material,

means for deriving the difference between said reference signal and the output signal of said circuit detecting means to produce an error signal as an indication of the density deviation of said material from said desired density.

3,984,896

SAFETY DEVICE FOR LINT CLEANERS

George O. Hicks, 1660 S. McCall, Selma, Calif. 93662

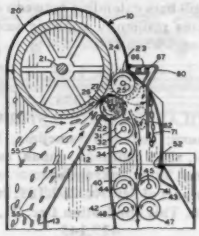
Filed Aug. 14, 1975, Ser. No. 604,610

Int. Cl.[2] D01G *31/00*; B65G *43/08*

U.S. Cl. 19—.23 **8 Claims**

1. In an apparatus through which lint is traveled, feed rollers for conveying the lint along a predetermined path, drive means connected to the feed rollers, and a housing for the feed rollers having an access door movable between predetermined open and closed positions adjacent to the feed rollers; a safety device comprising

A. a probe pivotally mounted adjacent to said predetermined path and the door having a rest position to which it gravitates adjacent to the path and a retracted position



adjacent to the door to which it is thrust whenever the lint conveyed along the path exeeds a predetermined thickness;

B. an energizing circuit for the drive means having a switch closed by movement of the probe to rest position; and

C. a linkage interconnecting the door and the probe which moves the probe to retracted position when the door is moved to open position.

3,984,897

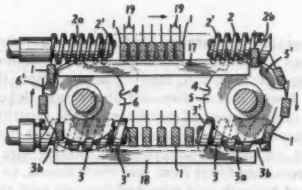
GILLING MACHINE

Haruo Takao, 3-5, Higashi 1-chome, Sakurano-cho, Sakai, Osaka, Japan

Filed Jan. 8, 1975, Ser. No. 539,598

Int. Cl.[2] D01G *19/10*

U.S. Cl. 19—129 R **3 Claims**



1. A gilling machine comprising, a plurality of gill bars, a first pair of spaced, parallel, spirally threaded advance faller screws driven for advancing said plurality of gill bars in a forward direction and extending therebetween, a second pair of spaced parallel, spirally threaded backward-movement faller screws disposed in vertical planes corresponding with corresponding ones of the first pair of advance faller screws and driven for transporting said plurality of gill bars in a backward direction, first transfer means for transferring the gill bars from the advance faller screws to the backward-movement faller screws, second transfer means for transferring the gill bars from the backward-movement faller screws to the first pair of advance faller screws, said first transfer means comprising a first pair of wheels axially spaced on a common axis and driven rotationally in synchronism with said faller screws for receiving the gill bars from the first pair of advance faller screws and transferring them to the backward-movement faller screws, said second transfer means comprising a second pair of wheels axially spaced on a common axis and driven rotationally in synchronism with said faller screws for receiving the gill bars from the backward-movement faller screws and transferring them to the first pair of advance faller screws, each of said wheels having angularly spaced peripheral

notches angular spaced on the periphery thereof corresponding to the patch of the threads on said faller screws for receiving the gill bars therein, guide means adjacent said first pair of wheels and guide means adjacent said second pair of wheels defining arcuate guide paths through which said gill bars are moved extending transversely thereof during conveying thereof by said transfer wheels, each of said gill bars having opposite ends received in a thread of a corresponding faller screw with said gill bars extending between a pair of said faller screws, and means resiliently applying said gill bars in said notches toward said wheels.

3,984,898
MULTILAYER FIBROUS STRUCTURES

Hisashi Matsumura; Tadanori Samejima; Hiroshi Orito, and Hisashi Ochiai, all of Shizuoka, Japan, assignors to Honshu Paper Company, Ltd., Tokyo, Japan

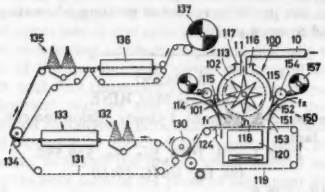
Continuation-in-part of Ser. No. 262,185, June 13, 1972, Pat. No. 3,781,150. This application Dec. 21, 1973, Ser. No. 427,145

Claims priority, application Japan, Dec. 29, 1971, 47-1229

The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.

Int. Cl.[2] D01G *25/00*

U.S. Cl. 19—156.3 **6 Claims**



1. Apparatus for forming and producing webs for nonwoven uses which comprises: a long fiber defibrating unit comprising a lickerin roll, feed means to supply the lickerin roll with fibers, means disposed above said lickerin roll to assist the dispersement of said fibers by the centrifugal forces of the lickerin roll, and chute means to direct the dispersed long fibers, an endless conveying and forming wire associated with and receiving fibers from said chute means, an air suction box located beneath said wire and beneath said chute means associated with said wire; a short fiber defibrating unit comprising a shredder to shred woodpulp, a refiner fed by said shredder to disintegrate the shredded woodpulp into single fibers, a short fiber disperser operatively associated with said long fiber defibrating unit and comprising an elongate cylindrical separating wall having sifting openings uniformly distributed over substantially its entire circumferential areas, a duct conveying fibers from said refiner to said short fiber disperser, a rotary shaft journaled within said wall, dispersing means rotatably mounted on said shaft and operatively associated with said separating wall for separating undispersed short-length woodpulp fibers, which may have flocked together during conveyance along the duct, into finely dispersed elementary fibers; a casing disposed in surrounding relation to said separating wall and defining therewith an annular dispersing chamber having a downwardly directed fiber outlet for dispersed fibers, said casing flaring towards said fiber outlet and being provided on opposite sides thereof with an elongate aperture communicating with the atmosphere for introducing a volume of air into said chamber, and a damper and air intake provided in said dispersing chamber regulating the volumetric ratio of air to fiber within said chamber, said fiber outlet being open to said endless wire underlying said fiber outlet for the deposition thereon of dispersed fibers.

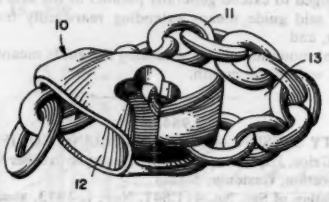
3,984,899
CHAIN-TYPE CHOKER HOOK

Melvin M. Northe, Portland, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed Dec. 1, 1975, Ser. No. 636,425

Int. Cl.[2] F16G *15/00*; B66C *1/12*

U.S. Cl. 24—230.5 LH **4 Claims**



1. A choker hook for use with oval link chain comprising a unitary body of generally rectangular configuration and having thereby front, back, side and end walls, there being a passage through said body adjacent one of said end walls from one side wall to the other and constituting the eye through which an intermediate portion of said chain is supported,

said front wall having a cross-shaped opening therein and thereby having four legs communicating with an internal cavity in said body adjacent the other of said end walls, said cavity being separated from said passage by a generally arcuate cross wall,

one of said legs being elongated to provide a first slot portion extending into one of said side walls, a second slot portion in said one side wall communicating with said first slot portion and said cavity and extending generally perpendicularly to said first slot portion and toward and into said other end wall whereby an end portion of said chain is insertable into said cross shaped opening and a link thereof moved through said slot portions to secure said chain end portion to said body.

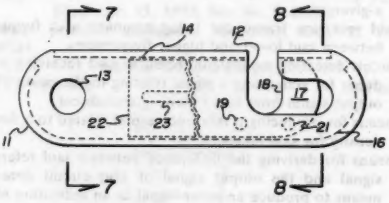
3,984,900
COUPLING DEVICE

Frank Cirelli, East Providence, R.I., assignor to James R. Johnston, San Diego, Calif.

Filed Aug. 29, 1975, Ser. No. 608,825

Int. Cl.[2] A44B *13/00*

U.S. Cl. 24—238 **1 Claim**



1. A coupling device comprising:

a flat elongated outer member, said flat elongated outer member having first and second parallel sides joined at one edge thereof, said first and second sides defining an elongated slot;

at least one recess through said one edge of said flat elongated member adjacent to one end thereof;

a flat elongated inner member, said flat elongated inner member having first and second parallel sides joined at one edge thereof;

at least one opening through said one edge of said flat elongated inner member adjacent to one end thereof; and

at least one protuberance on each of said first and second parallel sides of one of said outer or inner members, said protuberance being in the direction of the first and second parallel sides of the other of said outer and inner member walls.

3,984,901

SLIDE FASTENER STRINGER WITH A ZIGZAG-SHAPED CONTINUOUS COUPLING ELEMENT

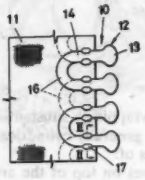
Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Dec. 27, 1974, Ser. No. 536,999

Claims priority, application Japan, Dec. 28, 1973, 49-5001[U]

Int. Cl.² A44B 19/40, 19/10

U.S. Cl. 24—205.16 C **3 Claims**



1. In a slide fastener stringer of the type including a stringer tape, and a continuous coupling element mounted on said stringer tape, said continuous coupling element having a zigzag configuration including a series of ladder-like transverse portions each of which has a coupling head and a pair of legs extending rearwardly therefrom to hold a longitudinal edge portion of said stringer tape therebetween, said continuous coupling element also including a series of longitudinal connective portions each interconnecting two adjacent transverse portions and alternately located on the opposite sides of said stringer tape, the improvement which comprises on each pair of said legs means defining a tape gripping portion extending over a limited length portion of a respective leg and having a transverse cross-section different from that of the remainder of the leg toward both legs ends and defining a flat surface, the flat surfaces of each pair of tape gripping portions being disposed in opposite spaced-apart relation to each other and in engagement with respective opposite sides of the stringer tape to secure the coupling element thereto, each of said tape gripping portions being disposed intermediate a respective coupling head and a respective connective portion.

3,984,902

APPARATUS FOR COATING SKIRTLESS CATHODE RAY TUBE PANELS

Charles J. Prazak, III, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 5, 1976, Ser. No. 646,459

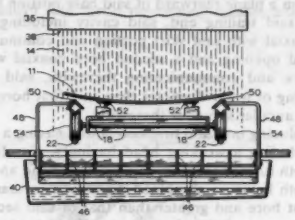
Int. Cl.² H01J 9/06

U.S. Cl. 29—25.19 **10 Claims**

1. Apparatus for applying a coating of phosphor slurry or other liquid materials to the concave inside surface of a curved skirtless cathode ray tube front panel, comprising:

means for establishing a falling liquid curtain of said coating material; and

means for conveying said panel with its concave surface facing upwardly along a predetermined path through said curtain, said path being caused to have a curvature through said curtain which corresponds generally to the curvature of said panel such that each consecutive elemental surface area of said panel meets the curtain at an angle of approximately 90°, as measured between the curtain and the direction vector of the elemental area, thereby producing a high degree of uniformity in the coating applied to the panel.



3,984,903

METHOD OF SPANNING ACROSS A FRAME A HIGH-MOLECULAR-WEIGHT PIEZOELECTRIC ELEMENT

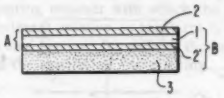
Naohiro Murayama, and Hiroshi Obara, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1975, Ser. No. 640,675

Claims priority, application Japan, Dec. 13, 1974, 49-142435

Int. Cl.² B01J 17/00

U.S. Cl. 29—25.35 **16 Claims**



1. A method of spanning across a frame, a piezo-electric element of the type consisting of a thin high-molecular-weight piezo-electric film having thin electrodes on both sides thereof, comprising,

a. affixing a base film thicker than said element to the electrode on one side of said element to form a laminated body comprising said piezo-electric element and said base film,

b. adhering a frame to the exposed surface of the opposite thin electrode, and

c. removing said base film.

3,984,904

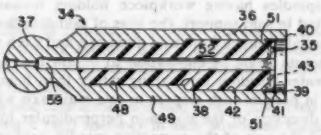
INTERNAL RETAINING TABS FOR A FILLED PISTON

Charles H. Schlecht, York, Pa., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 27, 1974, Ser. No. 527,720

Int. Cl.² B23P 15/10

U.S. Cl. 29—156.5 R **1 Claim**



1. A process for the production of a lightweight piston of the type used in fluid translating units, wherein said piston includes a base portion for engaging said piston with said unit

and an attached skirt portion having a trailing end, said method comprising:

forming a cavity within said skirt portion extending axially from a plane rearward of said base portion to an opening in said trailing end, said cavity including a first bore coaxial with said skirt portion and communicating with said opening and a second bore coaxial with said first bore and communicating therewith, said second bore being of lesser diameter than said first bore and forming an annular shoulder therewith;

introducing into said first bore a tool having a base member including a working head having a plurality of cutting teeth formed thereon, said working head and said cutting teeth having a combined diameter less than that of said first bore and greater than that of said second bore for engagement of said cutting teeth with said annular shoulder;

axially cutting portions of said shoulder in a one step operation to deflect inwardly a plurality of circumferentially spaced projections extending into said cavity; and

filling said cavity with a core of lightweight filler material engageable with said projections.

3,984,905

MULTI-SPINDLE AUTOMAT

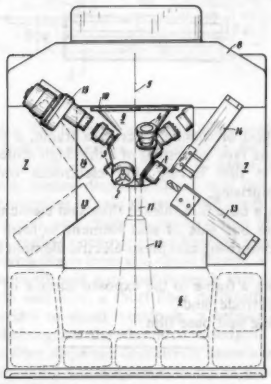
Fritz J. G. E. Petzoldt, 6 Arnspitzstrasse, 8102 Mittenwald, Germany

Filed July 24, 1974, Ser. No. 491,561

Claims priority, application Germany, July 27, 1973, 2338207

Int. Cl.[2] B23P *23/00*

U.S. Cl. 29—38 R **14 Claims**



1. A multiple spindle workpiece turning automatic lathe machine having in combination a frame, said frame mounting tools disposed at plural work stations, a workpiece spindle support supported in the frame and having means for indexing between said work stations on a main axis, a plurality of workpiece spindles having workpiece holding means rotatably supported in said support, the axes of said spindles being the same radial distance from said main axis and each making the same actute angle of inclination to obtain free accessibility and greater freedom for turning rather than being close together in parallel with respect to said main axis when viewed in the direction of the common perpendicular to said main axis and the axis of the respective spindle, said spindle axes with said angle of inclination being tangent to the same cylinder coaxial with said main axis, the points of tangency of the axes of the work spindles to said cylinder being coplanar, and means to rotate said workpiece spindles.

3,984,906

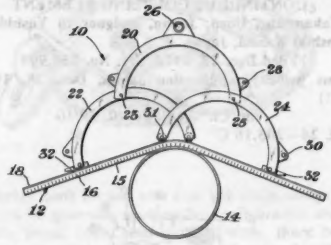
SHEET WRAPPER

James A. Schlosser, Essexville, and Walter A. Trumbull, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 469,142, May 10, 1974, Pat. No. 3,899,913. This application Mar. 3, 1975, Ser. No. 554,952

Int. Cl.[2] B29C *17/00*

U.S. Cl. 29—157 R **5 Claims**



1. A method for wrapping a substantially flat sheet material about an elongated generally cylindrical article, said method comprising the steps of:

a. placing the sheet on top of the article so that its width traverses the longitudinal centerline of the article,

b. applying sheer gravitational pressure against the surface of the sheet by advancing the pressure along said surface in a direction from the longitudinal center of said sheet to its width extremities,

c. continuing application of such gravitational pressure until the sheet encloses the circumference of said article, and

d. securing together free ends of the sheet enclosing the article so that the sheet forms a tube about the article.

3,984,907

ADHERENCE OF METAL FILMS TO POLYMERIC MATERIALS

John Louis Vossen, Jr., Bridgewater, N.J.; Frederick Russell Nyman, Carmel, and George Frederick Nichols, Oaklandon, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed July 25, 1975, Ser. No. 599,130

Int. Cl.[2] B32B *15/08, 15/20*

U.S. Cl. 29—195 **6 Claims**

1. A laminate of a film from about 25 to about 50 angstroms thick of copper, a layer of an alloy of chromium and nickel which can contain up to about 10 percent by weight of iron from about 200 to about 400 angstroms thick and a film of copper about 25 to about 50 angstroms thick wherein said copper films are disposed on either side of said alloy layer.

3,984,908

STATOR TERMINAL ASSEMBLY MACHINE

George Nelson Ackley, assignor to Amp, Incorporated, Harrisburg, Pa.

Filed Oct. 1, 1975, Ser. No. 618,649

Int. Cl.[2] H02K *15/00*

U.S. Cl. 29—205 D **18 Claims**

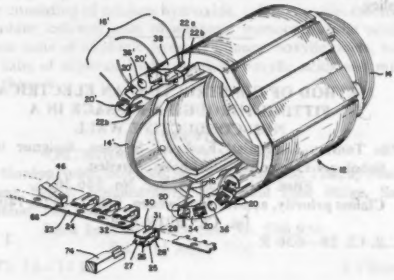
1. Apparatus for attaching a contact terminal to an electrical conductor and positioning said terminal and said conductor in an insulating housing, said terminal having conductor receiving means for establishing electrical contact with said conductor upon relative movement of said terminal towards the axis of said conductor, said conductor being initially spaced from said terminal and in alignment with said conductor receiving means, said apparatus comprising:

mounting means for positioning said insulating housing,

movable ram means movable towards and away from said mounting means,

actuating means for moving said ram means towards said mounting means

movable depth control means attached to said ram means by resilient lost motion connection means, said movable depth control means being movable towards said mounting means upon initial movement of said ram means towards said mounting means with said depth control means abutting a reference surface fixed with respect to said housing upon partial movement of said ram means toward said mounting means, further movement of said depth control means towards said mounting means being thereafter prevented,



first stop means located on said movable depth control means,

second stop means located on said movable ram means so that said second stop means abuts said first stop means when said ram means has moved a prescribed initial distance after movement of said movable depth control means has stopped, whereby

said ram means imparts relative lateral movement between said conductor and said terminal and said conductor is inserted at a precise point in said conductor receiving means in said terminal, said precise point being located a constant predetermined distance from said reference surface.

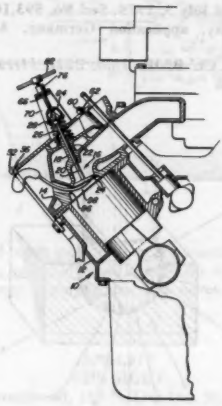
3,984,909

VALVE STEM SEAL CHANGING TOOL

Salvador Velazquez, 5051 N. Kenmore, Apt. 205, Chicago, Ill. 60640

Filed May 6, 1975, Ser. No. 574,921
Int. Cl.² B23P *19/04*
U.S. Cl. 29—217 **8 Claims**

1. In combination with an internal combination engine including an elongated overhead poppet valve equipped cylinder head and provided with laterally outwardly projecting exhaust manifold mounting means on one side of said engine, said head including a plurality of upwardly projecting poppet valves arranged in side-by-side relation along a generally straight path extending longitudinally of said head, a tool for enabling the valve spring retainer keepers, the spring retainers and the springs to be removed while the head remains mounted on the engine and to thereby enable the valve stem seals to be replaced, said tool including an elongated support member supported from said engine on said one side thereof from said mounting means and with said support member generally paralleling said path, an elongated arm having one end thereof mounted on said support member for guided shifting therealong and with said arm disposed at generally right angles to said support member and swingable relative thereto about an axis generally paralleling said support member into and out of position overlying at least portion of said valves and disposed transverse to said path, the other free end of said arm and said engine, adjacent the other side of said head, including coacting means for releasably retaining said free end against displacement thereof to swing said arm away from said valves, and selectively actuatable thrust developing means carried by said arm intermediate its opposite ends including a valve spring retainer abutment member shiftable, upon actuation of said thrust developing means, laterally of



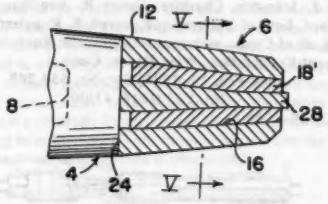
said arm in a path generally paralleling the plane in which said arm is swingable, said abutment member, upon movement toward a valve spring retainer with which the path of movement of said abutment relative to said arm is aligned, being engageable with said retainer for shifting the latter in a direction to compress the associated valve spring.

3,984,910

MULTI-MATERIAL RIPPER TIP

Eugene L. Helton, Peoria, and Walter B. Miller, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 425,191, Dec. 17, 1973, Pat. No. 3,932,952. This application Sept. 8, 1975, Ser. No. 611,283
Int. Cl.² B22F *3/24*
U.S. Cl. 29—420 **3 Claims**



1. A method of fabricating a ripper tip having a support portion and a nose portion with a centrally disposed bore therein containing wear resistant core material, said method comprising the steps of:

a. placing said core material in said bore in powdered form;

b. inserting a rigid member in said powdered material to tightly pack said material within said bore;

c. applying heat to said nose portion with said rigid member in place to sinter said material in said bore; and

d. attaching said nose portion to said support portion.

3,984,911

PROCESS FOR MANUFACTURING AN ELECTRODE FOR ELECTROLYTICALLY FORMING A GROOVE PATTERN IN AN ARCUATE SURFACE OF AN ARTICLE

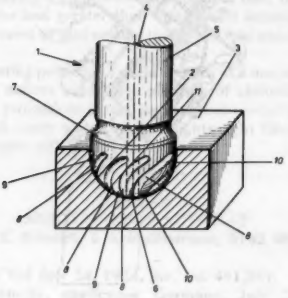
Manfred Krug, Schweinfurt, and Siegbert Kessler, Rottershausen, both of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

Filed July 3, 1975, Ser. No. 593,169

Claims priority, application Germany, Aug. 1, 1974, 2437047

Int. Cl.[2] B23P 17/00; B22D 11/126

U.S. Cl. 29—424 13 Claims



1. A method for producing an electrode for the electrolytic formation of a pattern of grooves in an arcuate surface of an article, comprising forming grooves in one side of a planar conductive blank, then reshaping said blank to have a curvature corresponding to said arcuate surface of said article, with said one side of said blank having a curvature opposed to that of said arcuate surface, then applying an insulating layer to said one side of said reshaped blank, then stripping said layer from said reshaped blank except in the regions thereof overlying said grooves, whereby a residual insulating layer remains on those areas of said reshaped blank overlying said grooves, and then recessing the stripped areas of said one side of said reshaped blank by eroding the material of said reshaped blank in those areas which are not covered by said residual insulating layer.

3,984,912

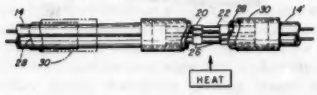
METHOD FOR SPLICING CABLE

James J. Johnston, Cheshire; Henry R. Angelico; Walter J. Bedard, both of Milford, and Joseph E. Ruggiero, Wallingford, all of Conn., assignors to Automatic Equipment Development Corporation, West Haven, Conn.

Filed Feb. 28, 1975, Ser. No. 554,208

Int. Cl.[2] H01R 43/00

U.S. Cl. 29—628 7 Claims



1. A method for splicing two cable end portions, each of the cable end portions having a jacket of electrical insulation containing at least one wire conductor, said method comprising the steps of providing at least one tubular electrical connector made from electrically conductive material, coating the entire outer surfaces of said connector with electrical insulating material, stripping an end portion of the insulation jacket from each of the two cable end portions to expose an end face of each insulation jacket and an end portion of each one wire conductor, applying sealing material to the exposed end face of each insulation jacket, inserting each one wire conductor into an associated end portion of the one coated electrical connector to bring each end portion of the one connector into generally abutting and sealing engagement with an end face of an associated cable jacket to which sealing material has been applied, crimping portions of the one coated electrical connector inwardly and into gripping engagement with each one wire conductor disposed therein whereby to form a basic splice which includes the one connector and an end portion of each of the two jackets sealed in abutting relation with the ends of the one connector, positioning a tubular melt sleeve in generally coaxial surrounding relation with the basic splice, and applying heat to melt said melt sleeve into surrounding sealing engagement with the basic splice.

3,984,913

METHOD OF CONSTRUCTING AN ELECTRICAL FITTING THROUGH A PASSAGE IN A NON-CONDUCTIVE WALL

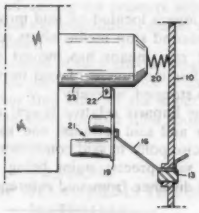
Nils Tommy Lindquist, Enskede, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Feb. 3, 1975, Ser. No. 546,303

Claims priority, application Sweden, Feb. 7, 1974, 7401618

Int. Cl.[2] H01R 9/00

U.S. Cl. 29—630 R 1 Claim



1. A method of making an electrical fitting through a passage in a non-conductive wall comprising the steps of:

a. inserting an uninsulated electrical conductor through said passage, said conductor being of relatively rigid material and having one end on one side of said wall being adapted to electrically contact a conductive connecting means for an electrical apparatus, the end of said conductor on the other side of said wall having a mount for connection to a power supply wire, the cross-sectional area of said connector being substantially less than the cross-sectional area of said passage

b. inserting a detached rivet in said passage which is initially attached to said wall by means of a narrow bridge,

c. bending a first part of said electrical conductor at an angle to the longitudinal axis of the passage thereby forming a resilient element for firm contact with said conductive connecting means and bending another part of said electrical conductor to at least partly adjoin the outside of said wall adjacent to said passage, and

d. upsetting said rivet in said passage on either side of said wall whereby said conductor is urged against an adjacent relatively small part of the inner surface of the passage to form a firm connection between said conductor and the adjacent inner surface of said passage.

3,984,914

ORAL IMPLANT

Robert Schwartz, 1271 Westfield Ave., Rahway, N.J. 07065

Filed July 24, 1974, Ser. No. 491,501

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² A61C *13/00*

U.S. Cl. 32—10 A 10 Claims

1. An improved dental implant comprising an implant element fabricated from a biologically inert material, said implant element having an upper abutment and an interconnected lower substructure that is adapted to be placed upon or inserted within the alveolar bone of the maxillae or mandible, said substructure being provided with a reservoir or adherent coating of a calcium compound selected from the group consisting of calcium hydroxide, calcium oxide, calcium alcoholate, calcium salts of aliphatic monocarboxylic acids, calcium salts of aliphatic hydroxymonocarboxylic acids, calcium salts of aliphatic hydroxypolycarboxylic acids and mixtures thereof.

3,984,915

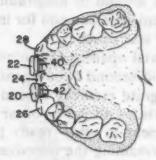
ORTHODONTICS BY MAGNETICS

Terry Gordon Noble, deceased, late of San Antonio, Tex., by Mary Lynne Noble, administratrix, 3223 Old Blue Ridge, San Antonio, Tex. 78230

Filed June 27, 1975, Ser. No. 590,934

Int. Cl.² A61C *7/00*

U.S. Cl. 32—14 R 8 Claims



1. A method for moving teeth in a patient's mouth comprising the steps of:

examining the patient to determine if teeth need to be moved;

attaching at least two magnets in the patient's mouth with at least one of said magnets being attached to a tooth that needs to be moved, said magnets exerting magnetic forces on each other to gradually move said tooth;

adjusting said magnets as necessary for proper movement of said tooth; and

removing said magnets from said teeth.

3,984,916

WEAPON SIGHT

Fred N. Newcomb, Kingsville, and Dominick J. Giordano, Forest Hill, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 6, 1975, Ser. No. 619,714

Int. Cl.² F41G *1/16*

U.S. Cl. 33—251 8 Claims

1. A weapon sight comprising:

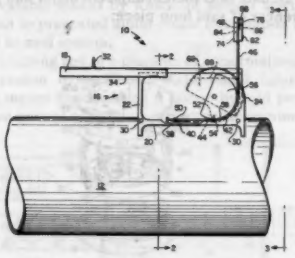
a housing have at least two lateral parallel walls and a cover slidably mounted to the top edge of said lateral walls;

a curved surface within said housing;

a flexible bar positioned on said curved surface and extending from said housing, said bar having a curved transverse cross-section;

a sight means on the extended end of said bar; and

range adjustment means having a portion exterior to said housing, an interior portion connected to said bar for moving said bar along said curved surface to vary the elevation of said extended end of said bar, and a flat surface;



wherein said cover includes a means coacting with said flat surface to lock said range adjustment means at a preselected range setting when said cover is substantially closed.

3,984,917

GUN SIGHT

Robert N. Korzeniewski, 115 N. Live Oak St., Carthage, Tex. 75633

Filed Aug. 26, 1974, Ser. No. 500,378

Int. Cl.² F41G *1/00*

U.S. Cl. 33—260 9 Claims

1. A gun sight for combat shooting along a line of sight, comprising a front sight portion including a base portion, a front center post extending vertically from the base portion and front side posts extending vertically from the base portion on both sides of the center post and also at least a substantial distance in the direction of the line of sight whereby a portion of a target can be bracketed between the side posts when the center post is obscured to provide horizontal sighting, and a rear sight portion including a full flat back having a linear top extending horizontally over substantially the entire width thereof with a centrally located notch therein to provide vertical sighting in conjunction with the side posts when the center post of the front sight portion is obscured.

3,984,918

INCLINOMETER

Preston E. Chaney, Dallas, Tex., assignor to Sun Oil Company (Delaware), Dallas, Tex.

Filed Oct. 2, 1974, Ser. No. 511,397

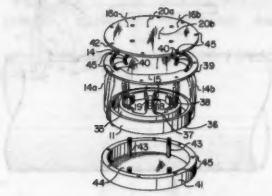
Int. Cl.² G01C *9/06*

U.S. Cl. 33—366 1 Claim

1. An inclinometer for use as a top-hole indicator comprising:

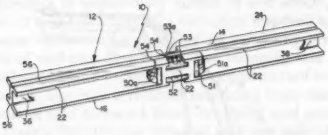
a dough-nut shaped loop piece having a circular trench formed therein that is concentric with the loop piece, said loop piece having a bar extending thereacross with a slot formed therein;

a ferrofluid partially filling said trench;
a core piece positioned in said slot;
exciter coil windings wrapped around said bar;
a loop piece lid on said loop piece, said lid having two pairs of arcuate slots therein adjacent major and minor circumferences of said loop piece;



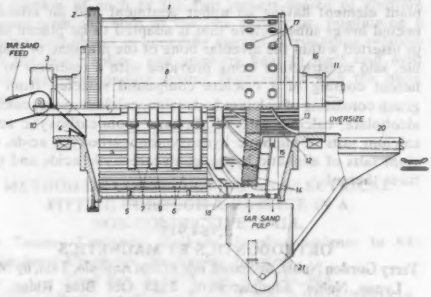
detector coil windings wrapped around said loop piece and through said arcuate slots;
and an outer case comprising a pan-shaped base member and a cover piece containing and enclosing said loop piece and loop piece lid.

3,984,919
LEVELING DEVICE
Richard E. Guisti, 308 Mauran Ave., East Providence, R.I. 02914
Filed Oct. 20, 1975, Ser. No. 624,174
Int. Cl.² G01C *9/28*
U.S. Cl. 33—381 **4 Claims**



1. A leveling device comprising an elongated stock having parallel top and bottom walls interconnected at opposite ends by centrally positioned longitudinally extending web portions defining an I-shape configuration when viewed from either end, a central connecting portion joining said top and bottom walls intermediate of said web portions, said connecting portion comprising parallel side walls each comprising a planar face having inwardly tapered portions at opposite ends thereof, a first pair of spaced top and bottom, slightly curved, elongated sockets extending longitudinally of the device and oppositely disposed to each other, said first pair of sockets being located adjacent the top and bottom edges of each of said side walls, and a second pair of similarly configured, oppositely disposed sockets extending in a transverse direction to said first pair and located on each side wall, a spirit tube snugly mounted in each of said sockets thus creating a cluster of four banana vials located on each side wall, said second pair of sockets being located at the juncture of said planar face and said tapered portions whereby one elongated edge of each said socket is positioned in said tapered portions and hence is inwardly disposed with respect to said planar face so that a portion of the tubes located therein is visible when the device is viewed from either end, the depth of said sockets measured from said planer face being slightly greater than the diameter of said tubes whereby the latter do not protrude beyond said planar face, and notched portions in said top and bottom walls in communication with said longitudinally extending sockets to render the tubes therein visible when the device is viewed from top or bottom.

3,984,920
TAR SANDS CONDITIONING DRUM
Brian W. Raymond; Donald A. Riva, and Frederick C. Stuchberry, all of Calgary, Canada, assignors to Shell Oil Company, Houston, Tex.
Filed Apr. 3, 1975, Ser. No. 564,958
Int. Cl.² F26B *11/02*
U.S. Cl. 34—134 **12 Claims**

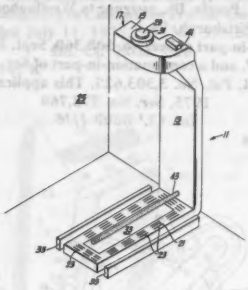


1. A tar sands conditioning drum for mulling of mined tar sand lumps into pulp through the addition of hot water, steam and caustic which comprises; a horizontally disposed cylindrical drum of a length to diameter ratio of between 0.5:1 and 1.25:1, rotatable around its longitudinal axis and having
a. an axial opening at one end for introduction of mined tar sand, water and caustic;
b. a second axial opening at the other end for rejection of oversize, said second axial opening being delimited by a peripheral grate member extending longitudinally along the drum axis for discharge of tar sand pulp, the grate size being sufficient to allow ready passage of the tar sands pulp while retaining the oversize; and
c. an externally supported stationary steam header extending into and substantially over the length of the drum interior along the longitudinal axis of the drum having affixed thereto, in fluid communication, a plurality of steam conduits which project downwardly from the steam header to a point above the lower interior surface of the drum, said steam conduits being positioned at spaced intervals along the length of the steam header and perforated for injection of steam into said cylindrical drum.

3,984,921
UNITARY DRIER
William Charles Adams, 185 Nassau Drive, Pittsburgh, Pa. 15239
Filed Dec. 6, 1974, Ser. No. 530,284
Int. Cl.² F26B *19/00*
U.S. Cl. 34—243 C **11 Claims**

1. A unitary device for use in drying the under portion of an automotive vehicle that is capable of being disposed into cooperative association with said automotive vehicle and its under portion comprising:
a. A vertically disposed forced air inlet duct that is capable of being placed adjacent to said automotive vehicle;
b. A source of forced air in cooperative association with said forced air inlet duct;
c. Means for heating said source of forced air to a predetermined temperature in cooperative association with said forced air inlet duct; and
d. A horizontally disposed forced air dispersing duct connected to said forced air inlet duct that is substantially coextensive with said under portion of said automotive vehicle that is capable of being placed under said under portion of said automotive vehicles; said dispersing duct

having a plurality of forced air discharge means that are arranged adjacent to said under portion of said automotive vehicle for discharging an array of forced and heated air impinging on said under portion.

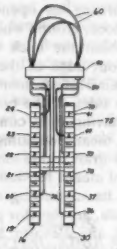


3,984,922

ROTORS

Leo Rosen, Apt. C, Heritage Apartments, River Road, Essex, Conn. 06426

Filed Oct. 10, 1944, Ser. No. 558,066
Int. Cl.² G09C *5/00*
U.S. Cl. 35—4 **2 Claims**



1. A cryptographic rotor including a first disc having an annular array of input contacts on one face thereof, a second disc having an annular array of output contacts on one face thereof, a plurality of wires connecting the input contacts to the output contacts in pairs, and means for supporting said two discs for rotative movement relative to each other.

3,984,923

SYSTEM AND PROCESS FOR PRESCHOOL SCREENING OF CHILDREN

Edward B. Rawson, Lincoln; Bernard Krasnick, Wayland, and Theodore Schaefer, Jr., Newtonville, all of Mass., assignors to Searle Medidata, Inc., Lexington, Mass.

Filed Sept. 6, 1974, Ser. No. 503,782
Int. Cl.² G09B *7/04*
U.S. Cl. 35—9 A **14 Claims**

1. An audio-visual system for presenting a sequence of questions having selectable correct and incorrect answers to a person for detecting possible learning handicaps, said system comprising:

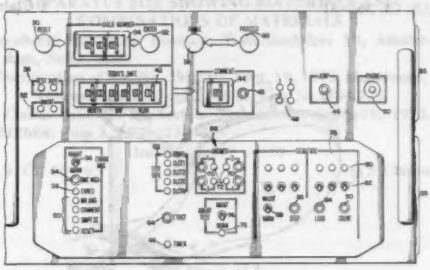
an audio-visual station having a portion for viewing a sequence of visual information and a portion for listening to a sequence of associated audio information;

said audio and visual information providing said questions having the selectable answers;

means for presenting a sequence of visual information and associated audio information to said person at said audio-visual station;

person activatable means by which an answer selected by said person to presented audio-visual information may be indicated to said system;

means for detecting any of a plurality of abnormal responses by said person to presented audio-visual information including means for detecting a failure by said person to indicate an answer selection within a predetermined time



interval and means for detecting an incorrect answer selection; and

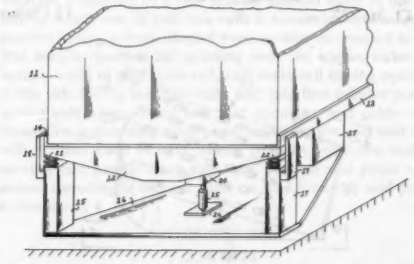
means operative upon detection of an abnormal response and operative in association with said presenting means for altering the sequence of presentation of the visual and associated audio information in accordance with characteristics of the detected abnormal response, including means for providing encouragement information to said person in response to detection of a failure by said person to indicate an answer selection after said predetermined time interval, and means for causing the presentation of an indication of a correct answer upon detection of an incorrect answer.

3,984,924

VIBRATORY SIMULATOR MOTION SYSTEM

Walter Edward Myles, Alexandria, Va., and James Anthony Sansonetti, Ellicott City, Md., assignors to The Singer Company, Binghamton, N.Y.

Filed June 23, 1975, Ser. No. 589,377
Int. Cl.² G09B *9/04*
U.S. Cl. 35—11 **4 Claims**



1. Apparatus for simulating the random simultaneous vibratory motion encountered in rail-borne vehicles, said apparatus comprising first, second and third support means, a generally rectangular personnel compartment, resilient means for supporting one end of said personnel compartment upon said first and second support means, a single universal resilient mounting means supporting the other end of said personnel compartment on said third support means, and a hydraulic cylinder

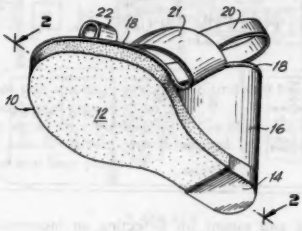
mounted off-center under said personnel compartment to impart intermittent forces thereto, said personnel compartment comprising an unbalanced mass on said first, second and third support means.

3,984,925

HYBRID SOLE FOR SHOES

Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.

Filed Dec. 19, 1974, Ser. No. 534,188
Int. Cl.² A43B 13/14
U.S. Cl. 36—31 1 Claim



1. A hybrid sole for shoes comprising

a. a solid first portion forming the toe and arch areas of said sole;

b. said solid first portion being comprised of comparatively soft, elastomeric, crepe rubber-like resilient material; and

c. a second lift portion forming the heel area of said sole;

d. said solid second portion being of comparatively hard, rigid, non-elastomeric, nylon-like material;

e. said second portion including a transverse lip integral therewith and disposed on the lower face thereof contiguous with said first portion; and

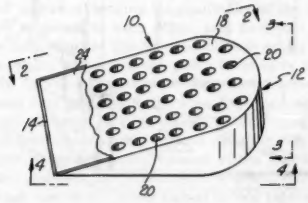
f. said lip bridging the seam formed between said first and second portions.

3,984,926

HEEL CUSHION

Samuel Calderon, 1501 Shanabrook, Akron, Ohio 44313

Filed Nov. 25, 1975, Ser. No. 635,138
Int. Cl.² A43B 21/32
U.S. Cl. 36—37 12 Claims



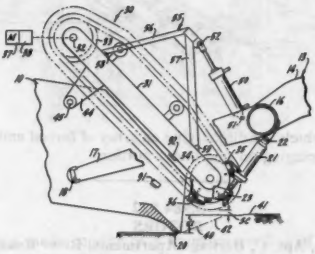
1. A heel cushion comprising a pad member having a pair of surfaces which diverge to a thickness ¾ inches to 1¾ inches, inclusive, said pad member being formed of a resilient and compressible material having a density in the range of 2.50 to 4.50 pounds per cubic foot, inclusive, and a compression in the range of 25 to 80 RMA, inclusive.

3,984,927

AUTOMATIC CONTROL OF ELEVATOR HEIGHT IN SCRAPER WITH MANUAL SETTING AND SELECTION OF ALTERNATE MODES

John H. Hyler, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 508,360, Sept. 23, 1974, Pat. No. 3,900,977, and a continuation-in-part of Ser. No. 510,143, Sept. 30, 1974, Pat. No. 3,303,623. This application May 19, 1975, Ser. No. 578,760
Int. Cl.² B60P 1/36
U.S. Cl. 37—8 9 Claims

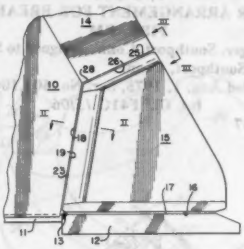


1. In an elevating type scraper for earth moving purposes, the combination comprising an open-fronted bowl having sides, back wall and a floor, ground wheels for supporting the bowl and mounted behind the back wall, a scraper blade extending along the front edge of the floor, a tractor-supported draft frame, a pair of draft members pivotally secured at the rear ends to the sides of the bowl and extending forwardly and upwardly having rigid connection at their front ends to the draft frame, means including a bowl hoist actuator interposed between the draft frame and the front end of the bowl and having control means for determining the degree of tilt of the bowl about its supporting wheels and hence the depth of cut of the blade, an elevator positioned at the open front end of the bowl, the elevator having a frame which extends upwardly and rearwardly from the region of the blade and which is mounted to the bowl for swinging movement in the longitudinal plane, the elevator having a pair of endless chains with transversely arranged flights, the chains having means for driving at one end of the frame and trained about rollers at the other end so that the flights sweep the soil loosened by the blade backwardly into the bowl, means including an elevator supporting actuator interposed between the draft frame and the elevator frame for supporting the elevator relative to the ground, and control valve means having a source of pressurized fluid for controlling the flow of fluid to the elevator supporting actuator and for locking fluid in such actuator so that the elevator is supported at a desired sweeping height above the undisturbed ground, the control valve means having means permitting free flow of fluid into and out of the elevator supporting actuator to establish a "free float" condition so that the elevator can rise and fall to accommodate obstructions on the ground, the control valve means further having an associated check valve interposed in the path of fluid flow for establishing a "checked float" condition in which the check valve yields to enable the elevator to climb upon an encountered obstruction thereby lifting itself to a higher level but with the check valve thereafter closing to block flow of fluid in the reverse direction so that the elevator is temporarily maintained at the higher level, and means for subsequently releasing the blocked fluid to restore the elevator to a normal working level.

3,984,928
CORNER REINFORCEMENT FOR VARIOUS SIZED LOADER BUCKETS

Stanley A. E. Oke, Batavia, and Jerome A. Thies, Kaneville, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed July 11, 1975, Ser. No. 595,201
Int. Cl.² E02F 9/28
U.S. Cl. 37—141 R 7 Claims

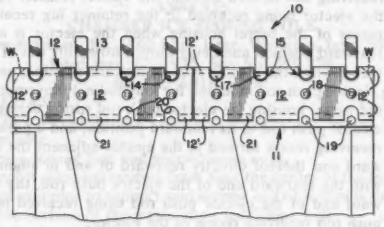


1. In a loader bucket of the type comprising a pair of vertically disposed sidewalls, a bottom wall, a horizontally disposed cutting edge secured on a forward edge of said bottom wall and extending transversely thereacross between said sidewalls and vertically disposed corner members having a bottom edge thereof secured to said cutting edge and a straight rearward edge therof secured to a straight forward edge of a respective sidewall, the improvement wherein said corner member is substantially thicker than said sidewall and the rearward edge thereof is entirely flat and is disposed closely adjacent and parallel to the straight forward edge of said respective sidewall, a bevel formed on an inboard side of said corner member to intersect the rearward edge thereof to define an obtuse angle with respect to an inboard surface of said sidewall, a first weld securing the bevel and the rearward edge of said corner member to the inboard surface and forward edge of said sidewall, and a separate second weld securing the rearward edge of said corner member to an outboard surface and the forward edge of said sidewall.

3,984,929
DETACHABLE CUTTING EDGE AND TIP-ADAPTER ARRANGEMENT FOR LOADER BUCKETS

David L. Meyer, Peotone, and Visvaldis A. Stepe, Willow Springs, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 8, 1975, Ser. No. 620,737
Int. Cl.² E02F 9/28
U.S. Cl. 37—141 R 13 Claims

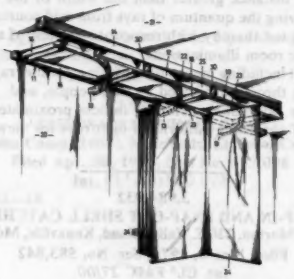


1. A work implement comprising an elongated and flat general purpose edge disposed forwardly thereon, a flat cutting edge mounted beneath said general purpose edge to be substantially co-extensive therewith and having a forward edge, a plurality of laterally spaced first notches formed on the forward edge of said cutting edge, a plurality of laterally spaced adapters each having an upper portion extending rearwardly over said general purpose edge and a lower portion extending rearwardly under said general purpose edge and disposed in a respective one of said notches, fastening means releasably securing ssid cutting edge and said adapters on said general purpose edge, and a hardened earthworking tip mounted on a forward end of each one of said adapters.

3,984,930
APPARATUS FOR SHOWING MATERIALS AND COMBINATIONS OF MATERIALS

Bernhard Telkekamp Booland, Waterlandplein 10, Amsterdam, Netherlands

Continuation of Ser. No. 398,795, Sept. 19, 1973, abandoned.
This application June 9, 1975, Ser. No. 584,725
Claims priority, application Netherlands, Sept. 19, 1972, 7212688; July 5, 1973, 7309429
Int. Cl.² G09F 11/30
U.S. Cl. 40—65 5 Claims



1. An apparatus for displaying materials and combinations of materials comprising a main-rail, a plurality of side-rails positioned serially one after each other, switch means connecting at least one side of each rail to said main-rail, a plurality of panels on which the materials to be displayed are mounted, said side-rails being spaced apart from each other a distance at least substantially equal to the width of one of said panels, wherein each of said main-rail and said side-rails has a tubular shape with a slot formed in the bottom wall and said switch means comprises a T-shaped member to which said main-rail and said side-rails are connected, each said T-shaped member consisting of a first tubular portion open at the bottom to which one of said side-rails is connected and a second portion having a hook-shaped cross-section connected to said first tubular portion for gripping over the upper, outer and bottom walls of said main-rail, said main-rail having openings at the side facing said side-rails, and said first tubular portion having side wings fitting into said openings, and guide roller means for connecting each panel to said main and said side-rails so that each of said panels is freely rotatable and for moving said panels along said rails, each of said guide roller means including a vertical shaft on which one of said panels is mounted.

3,984,931
ILLUMINATED OVERHEAD ADVERTISING DISPLAY

Paul Belokin, Jr., Rte. 4, Hayward, Wis. 54843

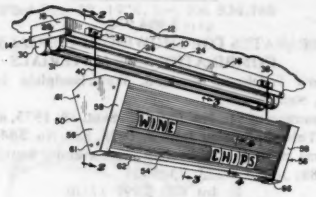
Filed Aug. 28, 1975, Ser. No. 608,771
Int. Cl.² G09F 13/00
U.S. Cl. 40—130 C 11 Claims

1. An overhead sign illuminated from a distance outside its confines comprising:

a horizontally elongated lighting fixture, having a housing supported on a wall of a room and an elongated source of

radiating parallel rays of light disposed in a plurality of diverging planes that have a substantially common axis of intersection for illumination in said room,

a translucent panel spaced from said axis and disposed with its light receiving face substantially parallel with said axis and disposed at an acute angle of inclination to a portion of said diverging planes where it may be viewed at approximately a right angle to the line of sight of people in said room,



means for supporting the source of light and said panel a spaced distance greater than the width of the panel for minimizing the quantum of rays from said source that are interrupted thereby with respect to the use of remaining rays for room illumination,

said panel including means for diffusing parallel rays of light passing through it viewed by said people, and

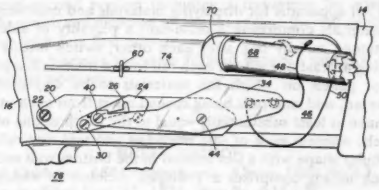
means on said panel including indicia proximate the face thereof absorbing patterns of light rays for viewing readability.

3,984,932

SNAP-IN AND SNAP-OUT SHELL CATCHER

Thomas B. Morton, 226 E. Valley Road, Knoxville, Md. 21758

Filed June 4, 1975, Ser. No. 583,842
Int. Cl.² F41C *27/00*
U.S. Cl. 42—1 T **10 Claims**



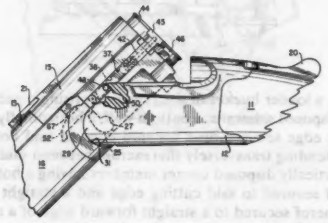
1. In combination, a firearm having a receiver with an opening in one side thereof for ejection of a spent shell therefrom, a shell ejection mechanism, and an extended reciprocable bolt in said receiver operable with said shell ejection mechanism to eject spent shell through said opening in said receiver, and a shell catcher having a fixed means attached to said receiver and a movable means spaced therefrom, means for pivotally mounting said movable means to said fixed means, a latching mechanism for latching said movable means in a predetermined position with respect to said fixed means and out of position of said opening in said receiver, said latching means having a triggering edge formed thereon and releasable when operated by said extended reciprocable bolt of said firearm, biasing means coupled between said fixed means and said movable means for biasing said movable means into an unlatched position, and hoop and loop means secured to said movable means and arranged to be clear of said opening in said receiver when said movable means is in a latched position with respect to said fixed means, with said hoop and loop means being positioned to cover said opening of said receiver to receive and secure a spent shell ejected through said opening when said movable means is in an unlatched position, whereby the extent and timing of the pivotal action of said movable means is limited and controlled by the latching mechanism and biasing means in conjunction with the normal firing and subsequent operation of the action of the extended reciprocable bolt engaging the triggering edge of said latching mechanism to release it from a latched to an unlatched position.

3,984,933

EJECTOR ARRANGEMENT FOR BREAK-OPEN FIREARM

William B. Ruger, Southport, Conn., assignor to Sturm, Ruger & Co. Inc., Southport, Conn.

Filed Aug. 1, 1975, Ser. No. 601,100
Int. Cl.² F41C *15/06*
U.S. Cl. 42—47 **11 Claims**



1. In a break-open firearm having a frame; a barrel housing pivotally mounted on the frame, said barrel housing being formed with at least one barrel receiving bore and with at least one ejector receiving slot; a barrel received in and secured to the barrel receiving bore of the barrel housing, said barrel and barrel housing being rotatable on the frame from their closed position to their open position and return; an ejector slidably mounted in the ejector receiving slot of the barrel housing for longitudinal movement from its forward position to its rearward shell ejecting position and return; and means for moving the ejector rearwardly when the barrel and barrel housing are moved from their closed position to their open position; the improvement in means for retaining the ejector in the ejector receiving slot of the barrel housing which comprises:

an integrally formed vertically extending ejector retainer lug disposed adjacent the forward end of the ejector, and an ejector retainer lug receiving recess formed in the barrel housing adjacent the forward end of the ejector receiving slot formed therein, the ejector retainer lug of the ejector being received in the retainer lug receiving recess of the barrel housing when the ejector is at its rearward position and being moved forwardly out of said recess when the ejector is at its forward position; and

an ejector push rod mounted for longitudinal movement on the barrel housing, an ejector push rod spring urging the ejector push rod to its rearward position, and a push rod receiving recess formed in the ejector adjacent the rearward end thereof directly rearward of and in alignment with the rearward end of the ejector push rod, the rearward end of the ejector push rod being received in the push rod receiving recess of the ejector;

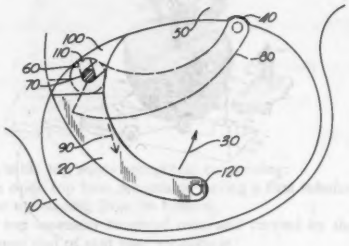
whereby the ejector is releasably retained in the ejector receiving slot of the barrel housing at its forward end by the ejector retainer lug receiving recess of the barrel housing and at its forward end by the ejector retainer lug receiving recess of the barrel housing and at its rearward end by the ejector push rod.

3,984,934

REMOVABLE SAFETY TRIGGER FOR FIREARMS

David Y. Weiss, New York, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed July 14, 1975, Ser. No. 595,385
Int. Cl.² F41C 17/00
U.S. Cl. 42—70 R 1 Claim



1. A removable safety trigger for firearms, comprising:
a firearm housing (50) forming a recess (40),
a trigger mount (100) mounted in the housing, the trigger mount (100) forming a recess (160),
a retaining pin (70) attached to the trigger mount centered in the recess (160),
a pressure releasing ball (110) mounted in the recess (160),
the trigger mount (100) forming a flat surface (150), a removable safety trigger (20) mounted in the trigger mount (100), whereby the trigger may rotatably act on the flat surface (150) to fire the firearm,
the trigger (20) forming a flat surface (145) that acts on the flat surface (150) of the mount (100), the trigger forming a round upper edge (140), the round upper edge (140) forming a pressure releasing ball socket (130),
the round upper edge (140) forming a slot (60), whereby the trigger (20) may slidingly engage the retaining pin (70) of the mount (100), and the trigger may be removed when the trigger is rotated to engage the firearm housing recess (40), and
the trigger (20) forming a key chain hole (120).

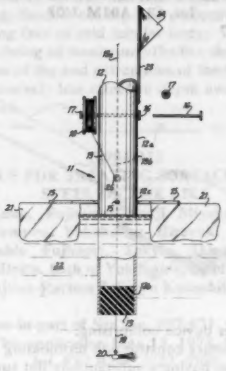
3,984,935

CHAMBER ICE FISHING POLE

Harry Petersen, Jr., 1860 Lark Lane, Waterloo, Iowa 50701

Filed Mar. 17, 1975, Ser. No. 559,270
Int. Cl.² A01K 87/00
U.S. Cl. 43—17 1 Claim

1. In a device for ice fishing, a chamber ice fishing pole comprising,
a pipe having first and second open ends,
support means extending from near the center of the length of said pipe to support said second end of said pipe below the surface of the water in an ice fishing hole,
a hole through the surface of said pipe between said first end and said support means for passage of a fish line into a chamber formed by the interior of said pipe,
seal means in covering relation to said second end comprising a rubber seal having a normally closed slit therethrough for passage of said fish line from said chamber to said water in a water sealing relationship with said seal, said seal dimensioned to fit the said second end in a



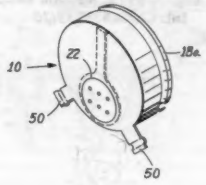
water-tight relationship with said pipe, thus forming an airtight chamber within said pipe.

3,984,936

DISPOSABLE ANIMAL TRAP

Russell John Camp, 24001 Muirlands, El Toro, Calif. 92630

Filed Apr. 30, 1975, Ser. No. 573,096
Int. Cl.² A01M 23/18
U.S. Cl. 43—66 6 Claims



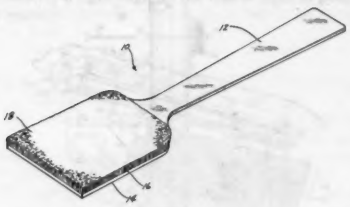
1. A disposable trap for animals which comprises:
a. a disposable container,
b. a cap attached to said disposable container,
said cap including means for removably retaining said cap upon said container,
said cap having an opening in the lower portion thereof for the passage of an animal therethrough, and
c. a closure element having a large lower portion for covering said opening, and having a narrow, elongate resilient upper portion, defining an integral springlike neck,
said upper portion being attached to the inside of said cap so that said lower portion is normally positioned immediately behind said opening, to maintain said opening normally closed,
said upper portion being of a size and resilience to allow said lower portion to be pushed into the trap by an animal entering through said opening and thereafter urging said lower portion back to
the normally closed position covering said opening to trap the animal,
said lower portion having one or more apertures through which an animal may scent bait placed in the trap and having edge regions extending beyond portions of said cap adjacent said opening, whereby said lower portion is prevented from being pushed outwardly through said opening by an entrapped animal.

3,984,937

FLYSWATTER DEVICE

Robert E. Hamilton, 822 - 4th, Grinnell, Iowa 50112

Filed July 21, 1975, Ser. No. 597,834
Int. Cl.² A01M 3/02
U.S. Cl. 43—137 1 Claim



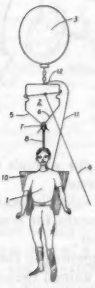
1. A flyswatter device comprising,
a handle of unitary construction terminating in an enlarged head portion having a substantially flat surface,
a layer of material extending completely over said head portion and being of a material different than said head and handle portions, said layer of material being capable of receiving and holding a static electrical charge sufficient to cause flies to electrically adhere thereto.

3,984,938

SKY DIVER TOY

Arthur Cowdrick, Spring Lake Heights, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 7, 1975, Ser. No. 602,593
Int. Cl.² A63H 33/20
U.S. Cl. 46—86 R 2 Claims



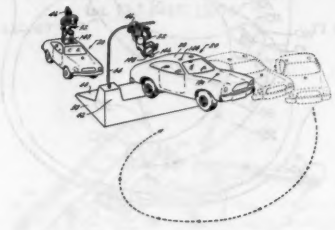
1. a sky diver toy, comprising
a miniature figure of a sky diver;
A balloon inflated with helium;
a releasable coupling device affixing the balloon to the figure and having a release cord extending therefrom to ground whereby the balloon raises the figure to a selected height and is released therefrom via said cord;
a parachute affixed to the figure whereby when the balloon is released from the figure the figure descends via the parachute, said parachute having a release device; and
a parachute release control device coupled between the coupling device and the parachute for releasing the parachute a predetermined time after the balloon is released from the figure, said parachute release control device comprising a spool and a length of cord wound on the spool and having one end affixed to the parachute release device and another end affixed to the coupling device in a manner whereby when the cord is unwound from the spool said cord operates the parachute release device.

3,984,939

TOY AUTOMOBILE

Chet Wolgamot, and Harvey G. Springer, both of Cincinnati, Ohio, assignors to General Mills Fun Group, Inc., Minneapolis, Minn.

Filed Sept. 11, 1975, Ser. No. 612,423
Int. Cl.² A63H 11/12, 29/10
U.S. Cl. 46—202 13 Claims



1. A toy automobile comprising:
a body having a front and a rear, a top and a bottom, and a longitudinal axis;
a drive wheel supported by the body for engaging a surface to propel the body thereon in a predetermined direction generally parallel to said axis;
a retractable skid-inducing means supported by the body for engaging the surface and deflecting the motion of the body from said direction, the skid-inducing means moveable between a first position remote from the surface and a second position engaging the surface; and
actuator means for moving the skid inducing means between said first and second positions.

3,984,940

DEGRADABLE PLASTIC

Murray Reich, 184 Loomis Court, and Donald E. Hudgin, 33 Bushkin Junction, both of Princeton, N.J. 08540

Continuation of Ser. No. 358,222, May 8, 1973, abandoned.
This application Apr. 28, 1975, Ser. No. 572,588
The portion of the term of this patent subsequent to June 3, 1992, has been disclaimed.
Int. Cl.² A01G 7/00
U.S. Cl. 47—9 2 Claims

1. In the growing of an agricultural crop in a field in which the field is at least partially covered with a plastic film for a predetermined growth period, the improvement which comprises ascertaining, from the meteoroligical data for the geographic area in which said field is located, the amount of TALU for said predetermined growth period, and covering said field with a film having a thickness of the order of magnitude of about 1 to 2 mils and consisting essentially of about 0.01 to 5% by weight of a stabilizer and polypropylene having a molecular weight in excess of about 40,000, the thermal treatment of said polypropylene prior to the time when it is applied to said field as a film having been such as to reduce its initial stability by at least about 5,000 TALU, said film having a stability approximately that of the TALU determined but at least about 8,000 but not in excess of about 35,000 TALU, whereby the film will degrade after said predetermined growth period, the degradation being accelerated or decelerated in accordance with the acceleration or deceleration of crop growth due to climatic conditions.

3,984,941

TABLE TOP WASTE RECEPTACLE

Nicholas J. Chetta, Jr., 5865 Memphis St., New Orleans, La. 70124

Filed Sept. 29, 1975, Ser. No. 617,666
Int. Cl.² A47G 7/02; B65D 1/24; A47G 7/06
U.S. Cl. 47—41 R 4 Claims

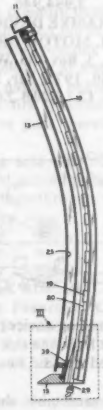
1. A table top waste receptacle comprising:
a. an open top base receptacle having a first tubular member upstanding from its bottom,
b. a top assembly received over and carried by the open upper end of said base receptacle,
c. a spider frame carried by said top assembly,
d. pivotally mounted trap doors spring biased to a normally closed position carried by said spider frame, and
e. a second tubular member having one closed and one open end carried by said spider frame, said closed end being received in the tubular member upstanding from the bottom of said base receptacle and the open end of said second tubular being open above said top assembly to receive decorative shrubbery and flowers above the waste receptacle.

3,984,942

INFLATABLE CLOSURE SEAL FOR SLIDING DOORS

Raymond A. Schroth, Pawling, N.Y., assignor to The Presray Corporation, Pawling, N.Y.

Filed Sept. 17, 1975, Ser. No. 614,248
Int. Cl.² E06B 7/22
U.S. Cl. 49—477 6 Claims



1. In a fluid inflatable seal for a sliding door, the seal comprising an elongated tubular body extending along the frame structure of the door and expandable into sealing contact with a surface of the door, and where the tubular seal body is closed by solid closure means at its end extremities, the improvement which comprises

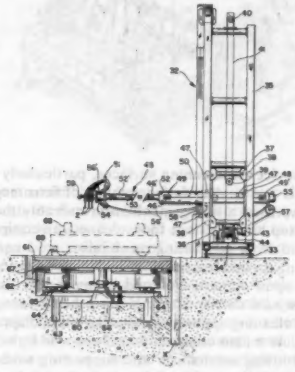
a. an auxiliary sealing member bonded to the tubular sealing body for a short distance in the region of its end extremities,
b. said auxiliary sealing member including longitudinally extending, flexible sealing ribs projecting outward from the sealing face of said tubular body,
c. said ribs being of maximum effective depth in the immediate area of the end extremities of the tubular body and of progressively less effective depth away from said end extremities.

3,984,943

APPARATUS FOR TREATING SURFACES OF SHEET STEEL OR THE LIKE

Yasumasa Kono, Fujisawa; Shuji Miyahara, Yokohama; Susumu Nomura, Yokohama; Hiroyuki Ohkubo, Yokohama; Yoshio Fujimori, Tokyo; Akira Iwawaki, and Hiromasa Hirata, both of Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 407,071, Oct. 17, 1973, abandoned. This application May 13, 1975, Ser. No. 577,116
Int. Cl.² B24C 3/22, 9/00
U.S. Cl. 51—8 R 11 Claims



1. An apparatus for continuously descaling at least one surface of an elongated object such as sheet steel or the like comprising: a nozzle for a slurry mixture including abrasive particles, a slurry tank for collecting said slurry mixture projected onto a surface of said elongated object, a vertically disposed wet type classifier operatively connected to said slurry tank and receiving said slurry mixture for classifying as to density and granular size, a receiving tank for collecting miniscule abrasives and the removed scales from the liquid overflowed from said classifier, a plurality of superposed elements in the lower portion of said classifier, means for supplying liquid to said classifier for upward flow at a constant speed through said superposed elements whereby the abrasive particles of a certain size are distributed uniformly in said liquid to form said slurry abrasives, and the miniscule abrasives and scale removed from the workpiece overflowing from said classifier to said receiving tank causing said miniscule abrasives and said scale to be separated out of said classifier, said nozzle accomodating a mixture of high pressure liquid and slurry abrasives which has been made uniform as to density and granular size to form said slurry mixture, a conduit arrangement for conducting said slurry abrasives at a relatively low pressure from said classifier at a point intermediate to its ends to said nozzle, and a high pressure pump operatively connected to said conduit arrangement whereby said high pressure liquid mixes with said slurry abrasives of uniform granular size which is supplied to said nozzle.

3,984,944
DEVICE FOR CLEANING SHIP'S SIDES, TANK WALLS, AND SIMILAR SURFACES

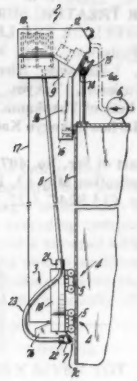
Wolfgang Maasberg, Dorfstrasse 14 (Post Drevenack), 421 Krudenburg, and Horst Scheiding, Duringer Strasse 4b, 2854 Loxstedt, Bremerhaven, both of Germany

Filed June 20, 1975, Ser. No. 588,894

Claims priority, application Germany, June 21, 1974, 2429838

Int. Cl.² B24C *3/06*

U.S. Cl. 51—9 M **10 Claims**



1. A device for cleaning surfaces, particularly ship's sides, tank walls and similar surfaces made of ferromagnetic material, comprising a lifting mechanism movably mounted adjacent the top of the surface to be cleaned, an equipment carrier suspended from said lifting mechanism, said equipment carrier having an undercarriage movable along the surface to be cleaned upon actuation of said lifting mechanism, magnetic means on said carrier attractable to the surface, said carrier having a cleaning apparatus including a liquid spray beam, and support line means connected between said liquid spray beam and said lifting mechanism and supporting said carrier from said lifting mechanism for delivering a material under pressure to said spray beam for application against the surface to be cleaned.

3,984,945
DEVICE FOR LAPPING BALLS IN CONTINUOUS OPERATION

Klaus Messerschmidt, Schonungen, Germany, assignor to Sebastian Messerschmidt Spezial-maschinenfabrik, Schonungen, Germany

Continuation-in-part of Ser. No. 539,502, Jan. 8, 1975, abandoned, which is a continuation of Ser. No. 322,279, Jan. 10, 1973, abandoned. This application Oct. 22, 1975, Ser. No. 624,969

Claims priority, application Germany, Jan. 18, 1972, 2202098

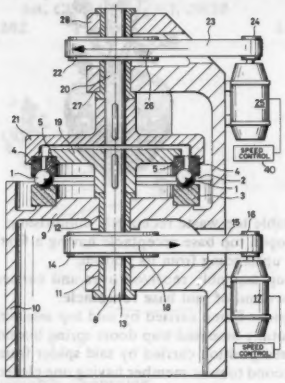
Int. Cl.² B24B *11/06*

U.S. Cl. 51—116 **11 Claims**

1. A ball lapping device for lapping an unlimited number of balls in continuous operation, said device comprising in combination:

two rotary working discs and one stationary working disc, said two rotary discs and said stationary disc being mounted in fixed special relationship so as to define therebetween an elongate working gap and said stationary disc having in its side facing the rotary discs an elongate guide track for guiding balls to be lapped along the working gap;

a rotary drive means and a transmission means for each of said movable working discs, each of said transmission means coupling the respective drive means to one of said working discs for driving said discs in opposite directions and at a selected differential speed, said opposite and differential rotations of the discs imparting to balls in said track a rotary movement and a movement along the track, the speeds of said movements being a function of the selected speed differential;



speed regulating means coupled to at least one of said drive means for regulating the rotational speeds of the working discs independent of each other for selecting the relative speeds of the discs thereby correspondingly varying the travel time of balls between said inlet and said outlet; and

ball inlet means communicating with said guide track for successively feeding balls to be lapped into the same and ball outlet means communicating with the track for successively discharging lapped balls from the guide track, said outlet means communicating with the guide track at a point spaced from the inlet means in the direction of movement of balls along the track.

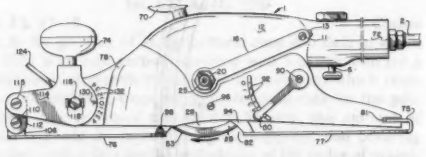
3,984,946
MOTOR DRIVEN ABRASIVE DEVICE WITH ROTATING, CYLINDRICAL MOTOR DRUM HOUSING

Warren W. Waters, Rte. 3, Box 435, Wichita Falls, Tex. 76308

Filed Oct. 20, 1975, Ser. No. 624,112

Int. Cl.² B24B *23/00*

U.S. Cl. 51—170 PT **11 Claims**



1. A motor driven abrading device, which device comprises;

a. a housing having at least one side thereof partially open,

1. a handle secured on said housing and forming a first handling means,

b. an apertured, non-rotatable shaft mounted within said housing,

1. a stator mounted on said shaft and being fixed against rotation with respect thereto,

c. a cylindrical, rotatable motor drum housing, having end plates thereon, journaled on said shaft for rotation about the axis thereof, and adapted to selectively extend through said at least one partially open side,

1. a sheet of abrasive material surrounding the periphery of said cylindrical, rotatable motor drum housing,
2. fastening means detachably securing each end of said sheet of abrasive material to said cylindrical, rotatable motor drum housing,

d. said cylindrical, rotatable motor drum housing and said stator forming a motor,

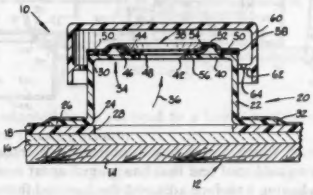
1. a source of power connected to said motor for rotating said cylindrical, rotatable motor drum housing about an axis on which said abrading sheet is detachably secured.

3,984,947

ROOF STRUCTURE INCLUDING A ONE-WAY VAPOR VENT

Francis Joseph Patry, Lewiston, Maine, assignor to Johns-Manville Corporation, Denver, Colo.

Filed July 31, 1975, Ser. No. 600,685
Int. Cl.² E04B 7/00
U.S. Cl. 52—1 **5 Claims**



1. A roof arrangement including a roof structure comprised of a roof deck, roof insulation disposed over said deck and a built-up roof disposed over said insulation, said arrangement further including a tubular vent having an opened entry end positioned against said roof structure and an exit end spaced from said structure whereby to allow gas and vapor within said roof structure to pass into said vent through said entry end and thereafter to the ambient surrounding through said exit end, the improvement comprising:

a. an outer flexible diaphragm connected across the exit and of said vent and movable between

i. a first position when the pressure within said vent is greater than the pressure outside said exit end, and

ii. a second position when the pressure within said vent is less than the pressure outside said exit end;

b. said diaphragm including at least one passage extending therethrough said passage being opened when said diaphragm is in said first position whereby to allow gas within said vent to pass therethrough to the ambient surrounding; and

c. means for closing said diaphragm passage when said diaphragm is in said second position, whereby to prevent gas from passing therethrough into said vent from the ambient surrounding.

3,984,948

COLLAPSIBLE BUILDING STRUCTURE

Willis A. Bussard, San Francisco, Calif., assignor to Altair Industries, Inc., San Francisco, Calif.

Filed Mar. 9, 1973, Ser. No. 339,727
Int. Cl.² E04B 1/344
U.S. Cl. 52—69 **14 Claims**

1. A building structure comprising:

a substantially flat base portion having first and second generally parallel edges;

a first panel assembly comprising a first panel associated with the first edge of the base portion and normally positioned substantially perpendicular to the base portion, and a second panel fixed to the first panel and generally perpendicular to the first panel;

a second panel assembly comprising a third panel associated with the second edge of the base portion and normally positioned substantially perpendicular to the base portion, and a fourth panel fixed to the third panel and generally perpendicular to the third panel;

the second and fourth panels disposed toward each other and having portions in lapping relation when the first and third panels are so normally positioned;

the first panel assembly and second panel assembly being movable outwardly of each other to outward positions;

means for maintaining the first and second panel assemblies in such outward positions;

wherein the first panel is hingedly fixed to the first edge of the base portion, wherein the third panel is hingedly fixed to the second edge of the base portion, and wherein the first and second panel assemblies are pivotable outwardly of each other through such hinged fixing;

wherein with the first and third panels normally positioned, a second panel portion overlaps a fourth panel portion, and further comprising a fifth panel hingedly fixed to the

first panel assembly to be pivotable to overlap the second panel with the first and third panels normally positioned, and pivotable away from said second panel to a position extending outwardly thereof with the first and second panel assemblies in said outward positions;

wherein the fifth panel is pivotable to completely and fully overlap the second panel, and the second panel completely and fully overlaps the fourth panel when the first and third panels are normally positioned; and

a first end member at one end of the structure and removably secured to the base portion, first and third panels in their normal positions, and the fifth panel, with the fifth panel pivoted to overlap the second panel, and a second end member at the other end of the structure and removably secured to the base portion, first and third panels in their normal positions, and the fifth panel, with said fifth panel pivoted to overlap the second panel, whereby the building structure is closed with the first and third panels normally positioned, the removal of the first end member and second end member allowing the first and second panel assemblies to be pivoted to their outward positions.

3,984,949

PORTABLE ROOM CONSTRUCTION

Carl D. Wahlquist, Woodland Hills, Calif., assignor to Building Components Research, Inc., Salt Lake City, Utah

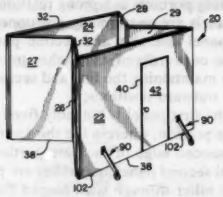
Filed Nov. 11, 1974, Ser. No. 522,664
The portion of the term of this patent subsequent to Feb. 4, 1992, has been disclaimed.
Int. Cl.² E04B 1/343
U.S. Cl. 52—70 **9 Claims**

1. A building structure comprising in combination:

an assembly of generally vertically-oriented wall panels together forming the four walls of a room and serially joined together to accommodate (a) folding at least one of the wall panels upon the other into a storage configuration and (b) unfolding the wall panels into an enclosed room configuration, the assembly of wall panels compris-

ing means facilitating displacement of the entire assembly from place to place at least when in the storage configuration;

a ceiling unit suspended above the wall panel, the ceiling unit comprising means for selectively lowering at least



part of the weight of the ceiling unit upon the unfolded assembly wall panels; and

means interposed above and below the wall panels for forming a seal when the weight of the ceiling unit is brought to rest upon the wall panel assembly.

3,984,950

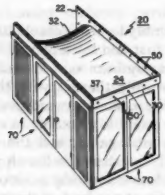
MODULAR BUILDING UNITS

Mark L. Hildebrand, New Haven; Henry A. Rudkin, Jr., Fairfield, and Nathaniel C. Wiley, Jr., Weston, all of Conn., assignors to Rudkin-Wiley Corporation, Stratford, Conn.

Continuation of Ser. No. 208,665, Dec. 16, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,463

Int. Cl.[2] E04B *1/348*

U.S. Cl. 52—79 **7 Claims**



1. A unitary building module, comprising integrated wall and ceiling portions, which when normally erected comprises:

A. a first integral, solid, opaque, opening-free, substantially vertical wall portion comprising inner and outer substantially parallel planar first surfaces, said first surfaces being about five feet high; the vertical edges of said first surfaces being extended substantially in the planes of said first surfaces above said wall portion forming a first U-shaped member;

B. a second integral, solid, opaque, opening-free, substantially horizontal ceiling portion comprising inner and outer substantially parallel planar second surfaces forming a substantially straight terminating edge and a minor segment of the ceiling portion of said module; the horizontal edges of said second surfaces being extended substantially in the planes of said second surfaces forming a second U-shaped member, and joining said first U-shaped member at right angles forming a framed area thereby;

C. a third integral, solid, opaque, opening-free, joining portion comprising inner and outer substantially parallel anticlastic third surfaces; said third surfaces extending smoothly between and merging with said respective inner and outer first and second surfaces of said wall and ceiling portions and the extended edges thereof, each of said third surfaces conforming to the equilibrium curvature formed by a single sheet of elastic material stretched and attached about its entire periphery in said framed area defined by said first and second U-shaped members at right angles to each other and the respective inner or the respective outer surfaces of said wall and ceiling portions and maintained in tension in said formed area with substantially all points of said elastic material having substantially the same tension; and

D. the ratio of the length to the width of said building module measured horizontally being an integer.

3,984,951

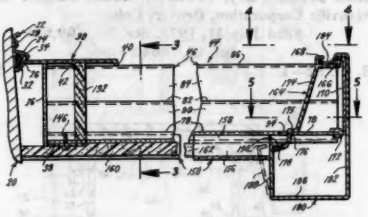
ROOF

Milo F. Hindman, No. 15 Evergreen, Centralia, Ill. 62801

Filed Apr. 24, 1975, Ser. No. 571,284

Int. Cl.[2] E04B *7/02*

U.S. Cl. 52—90 **19 Claims**



1. A roof which has a fascia-supporting member that is securable to said roof and that has spaced-apart arms, one of said arms having a surface adjacent the free end thereof which is disposable within an opening in said roof and which is engageable with an edge of said opening in said roof, the other of said arms having a surface adjacent the free end thereof which is engageable with an edge of said roof, the unstressed distance between said surfaces adjacent said free ends of said arms being less than the shortest distance between said edge of said roof and said edge of said opening in said roof, whereby said fascia-supporting member must be stressed as said surface adjacent said free end of said one arm thereof is set in engagement with said edge of said opening in said roof and said surface adjacent said free end of said other arm thereof is set in engagement with said edge of said roof, said fascia-supporting member developing restorative forces therein as said fascia-member is so stressed, and said restorative forces within said fascia-supporting member holding said surfaces adjacent said free ends of said arms of said fascia-supporting member in such intimate engagement with said edge of said roof and with said edge of said opening in said roof as to prevent accidental separation of said fascia-supporting member from said roof.

3,984,952

GAUGE PANEL STRUCTURE FOR ELEVATOR SHAFT ROUGH ENTRANCE OPENING

Charles M. Loomis, P.O. Box 453, Arkansas City, Kans. 67005

Filed Nov. 28, 1975, Ser. No. 635,915

Int. Cl.[2] E06B *1/04;* **B66B** *13/30;* **E04G** *21/18*

U.S. Cl. 52—127 **10 Claims**

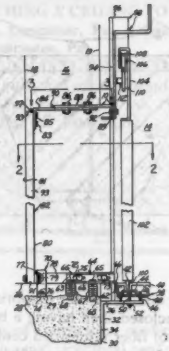
1. A gauge panel structure adapted to be mounted on a building corridor floor adjacent the entrance opening of an elevator shaft having an entrance opening frame secured in the entrance opening and adapted externally for precisely locating the outer face of an adjacent building corridor wall together with the opposite side surfaces and top surface of the intended wall opening, said gauge panel structure comprising

a corridor-wall-opening gauge panel having a peripheral outline corresponding generally to the outline of the intended entrance opening,

said panel having a bottom edge surface adapted to rest upon the building corridor floor, side edge surfaces adapted to serve as delimiting abutments for the laying

up of the corridor wall on opposite sides of the entrance opening, and a top edge surface adapted to serve as a limiting abutment for the corridor wall above the entrance opening,

lower panel-positioning means secured to the lower portion of said gauge panel and extending rearwardly therefrom



and adapted to be secured to a lower portion of the entrance opening frame,

and upper panel-positioning means secured to the upper portion of said gauge panel and extending rearwardly therefrom and adapted to be secured to an upper portion of the entrance opening frame.

3,984,953

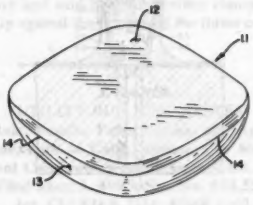
TRANSPORT CONFIGURATION FOR A MODULAR ENVIRONMENTAL SPACE MODULE

Ernest Joseph Kump, 360 Everett Ave., Apt. 2C, Palo Alto, Calif. 94301

Filed Nov. 22, 1974, Ser. No. 526,114

Int. Cl.² E04H 1/12

U.S. Cl. 52—143 **7 Claims**



1. A shipping assembly for transporting or storing a modular building structure, comprising a first concavo-convex shell half, a second concavo-convex shell half having a configuration for use as a roof component in the modular building structure, said first and second shell halves having faces around the edges thereof for abutting contact at all points therealong, whereby a single continuous seal line exists therebetween, means for joining said first and second shell halves at the edges thereof so that said shell halves define a package volume therebetween, a plurality of wall components centrally located within said package volume, said wall components being of a configuration for attaching to and extending between said first and second shell halves, a floor component supported within said package volume and a lower storage volume, said floor component being supported by members disposed toward the periphery thereof so that access to said lower storage volume is obtained by removal of said floor component, said plurality of wall components being positioned in said lower storage volume, a plurality of opening frames disposed within said package volume in said upper storage volume for interspersing with said wall components extending between said first and second shell halves in the erected modular building structure, whereby said package volume integrity is improved by said single seal line feature and components for erecting a modular building structure having a roof, floor and walls are provided when the shipping assembly is delivered to a construction site.

3,984,954

EXTERIOR WINDOW UNIT HAVING ADAPTER SILL PLATE

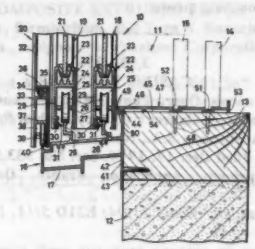
Hideichi Takeda, Ichikawa, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1975, Ser. No. 642,244

Claims priority, application Japan, Dec. 25, 1974, 50-4188[U]

Int. Cl.² E06B 3/26

U.S. Cl. 52—202 **10 Claims**



7. Means for supporting window sashes adjacent to a sill, said means comprising:

a. a frame adapted to support the sashes and having a second sill;

b. mounting means on said second sill and adapted to be attached to a vertical exterior surface of the first sill, said mounting means having first engaging means extending along its upper edge; and

c. a plate member for extending along the length of the first sill, said plate member being adapted to be secured to a horizontal surface of the first sill and having second engaging means at its outer edge interengaging said first engaging means.

3,984,955

EXTERIOR WINDOW UNIT HAVING IMPROVED FRAME SILL

Yukio Yamamoto, and Mitsuo Nagase, both of Kurobe, Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1975, Ser. No. 644,154

Claims priority, application Japan, Dec. 26, 1974, 50-3882[U]

Int. Cl.² E06B 3/26

U.S. Cl. 52—202 **3 Claims**

1. An exterior window unit for covering an opening in a building wall, the opening having a first sill from the ends of which a pair of side jambs extend vertically, said exterior window unit comprising:

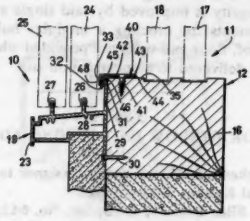
a. a frame having a second sill;

b. a pair of sashes mounted within said frame in parallel, closely spaced planes;

c. mounting means on said second sill and adapted to be attached to the vertical exterior surface of said first sill, said mounting means having first engaging means with a groove formed longitudinally therethrough; and

d. a plate member for extending along an outer marginal edge of and adapted to be secured to a top surface of the

first sill between the side jambs, said plate member having at its outer edge a second engaging means which is com-



plementary in cross-section to and received in said groove, and being adjustable longitudinally relative to said mounting means.

3,984,956

CASING VOUSSOIR

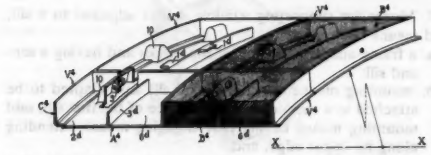
Jacques Francois Oger, Pont-a-Mousson, and Jean Claude Victor Hauer, Saulxures les Nancy, both of France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Dec. 17, 1974, Ser. No. 533,591

Claims priority, application France, Dec. 20, 1973, 73.45800

Int. Cl.² E04G *11/04*; E21D *5/11*, *11/08*

U.S. Cl. 52—249 7 Claims



1. A composite voussoir comprising a coherent mass of material, such as concrete or the like, and a metal reinforcement having web means which have substantially the shape of a portion of a cylinder and a peripheral fixing frame of curvilinear substantially rectangular four-sided shape extending substantially radially outwardly of the web means, a cavity defined by the web means and the frame, which cavity is open at least partially in the radial outward direction of the voussoir, the mass of material being contained in the cavity and having a first portion in radial engagement with at least a portion of the web means and a second portion radially outwardly offset from said portion of the web means, the fixing frame being defined radially outwardly by an outer geometric cylindrical surface and radially inwardly by an inner geometric cylindrical surface radially spaced from the outer cylindrical surface, the mass of material substantially completely radially filling the space between the outer and inner cylindrical surfaces, the reinforcement having means for hooking and radially retaining the mass of material, said hooking means comprising a plurality of spaced projecting flanges alternately extending in opposite directions substantially parallel to the web means, having radially offset positions relative to said portion of the web means, and engaging said second portion of the mass of material, the flanges being in one piece with the reinforcement and projecting from the top of a planar radially extending reinforcing rib which is in one piece with the web means of the reinforcement.

3,984,957

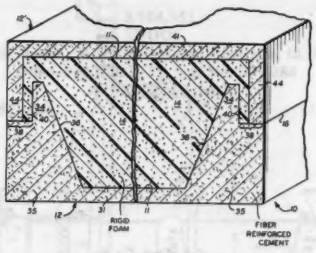
COMPOSITE BUILDING MODULE

Matthew R. Piazza, Nichols, Conn., assignor to Maso-Therm Corporation, Bridgeport, Conn.

Filed Dec. 31, 1975, Ser. No. 645,849

Int. Cl.² E04C *1/40*

U.S. Cl. 52—309 13 Claims



1. Composite building module comprising a rigid foam core encased in an enclosed shell having a bottom half and a top half, each made of fiber reinforced cement, said bottom half having a peripheral ledge and inwardly adjacent thereto a rib member extending above the level of said ledge, said top half having side walls forming a channel with said rib when the top of the shell is in place on the bottom half, said foam core being formed within the enclosed shell filling the interior thereof including said channel.

3,984,958

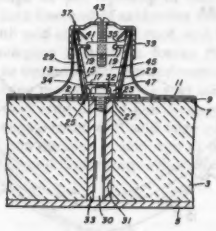
ROOF BATTEN ASSEMBLY

Wakefield Murray, Greensburg, Pa., assignor to Overly Manufacturing Company, Greensburg, Pa.

Filed Dec. 2, 1975, Ser. No. 636,997

Int. Cl.² E04B *5/57*; E04D *12/00*, *1/36*

U.S. Cl. 52—468 3 Claims



1. A batten assembly for use in sealing the edges of roofing sheets including: a batten comprising a pair of upwardly and longitudinally extending side walls, a longitudinally extending cross member securing the two side walls in spaced relation, external generally outwardly extending flanges disposed along the lower portion of each side wall, a plurality of longitudinally extending and laterally aligned slots spaced at intervals along each external flange adjacent the associated side wall, and cap strip securing means disposed between said side walls; a plurality of clips having intermediate portions securing the same to the roof by fasteners at spaced intervals along the confronting edges of adjacent roofing sheets, each said clip having leg portions which extend generally upward from each end of the intermediate portion and which pass through the longitudinal slots in the external flanges on each side of the batten and are bent inward and downward over the top edge of the adjacent side wall to firmly secure the batten in place; a cap strip with depending side walls which fit down over the

edges of the roofing sheets adjacent the batten which are bent upward along the batten side walls and then inward and downward over the top edge of the batten side walls and the clip legs; and fasteners securing the cap strip to the cap strip securing means between the batten side walls.

3,984,959

STRAP FOR ATTACHING A CEILING TO A STEEL DECK

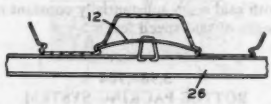
Kenneth L. Wasson, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Nov. 11, 1974, Ser. No. 522,354

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² E04B *5/52*

U.S. Cl. 52—484 **2 Claims**



2. The combination of a structural roof component and a ceiling system, wherein; said structural roof component being formed with a fluted roof deck structure which has a corrugated-type structure with a plurality of parallel extending flutes having their bottoms in a single plane and having therebetween a plurality of gaps, along both edges of the bottom of said flutes there being positioned ridges which form recessed surfaces facing towards said gaps, said ceiling system in combination therewith having a suspension runner for a suspended ceiling system, said suspension runner being fastened to said roof deck through the use of a support means comprising a strap member and a hanger member, said strap member being longer than the distance between two adjacent ridges and having its ends engaged in two adjacent ridges facing each other across a single gap and said strap member being bowed with a concave configuration facing towards said suspension runner, said hanger member being a generally U-shaped member connected to the strap member and said suspension runner is placed up against the bottom of the flutes of the roof deck structure and said hanger member clamps said suspension runner up against the bottom of the flutes of the roof deck structure.

3,984,960

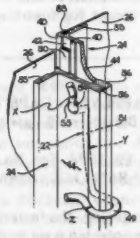
UTILITY BUILDING SYSTEM

Eugene L. Raio, Rancho Palos Verdes, and Andrew P. Kennedy, Irvine, both of Calif., assignors to Stearns Product Development Corporation, South Gate, Calif.

Filed Mar. 3, 1975, Ser. No. 554,558

Int. Cl.² F16B *2/24;* **E04B** *1/40*

U.S. Cl. 52—582 **7 Claims**



1. A fastener for securing a first member to a second member wherein said first and second members each include apertures, said apertures of said first and second members being in alignment comprising:

a first end for engaging a surface of said first member;

a generally elongated center section for engaging a surface of said second member, said center section being coupled to said first end so as to permit said fastener to pass through said aligned apertures, said first end and elongated center section lying in substantially the same plane; and,

a second end extending from said center section opposite said first end, said second end for engaging at least one of said first and second members such that said fastener remains in position;

whereby said first end of said fastener may be inserted through said aligned apertures and then positioned such that said first end engages a first member and said center section engages said second member and whereby the second end retains said first end and center section in place.

3,984,961

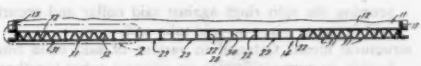
COMPOSITE EXTRUDED FLOOR

George Chieger, Birmingham, and Tara N. Banerjea, Warren, both of Mich., assignors to Fruehauf Corporation, Detroit, Mich.

Filed Aug. 4, 1975, Ser. No. 601,367

Int. Cl.² E04C *1/30, 3/04*

U.S. Cl. 52—593 **3 Claims**



1. A composite floor structure capable of supporting a maximum load for a lightweight shipping container comprising a plurality of hollow metal boards of substantially equal width, length and thickness, means securing said boards to each other in side-by-side relation, the boards adjacent the longitudinally extending sides of said structure having angularly disposed ribs forming triangles within the boards to maximize the resistance of said floor to shear deformation, the boards forming the central portion of said floor having spaced vertically extending ribs to maximize the resistance of said floor to longitudinal bending moments and crushing loads and to minimize weight thereof.

3,984,962

MAST STRUCTURE AND COMPOSITE STRUCTURAL FITTING THEREFORE

Fritz F. W. Krohn, Rancho Santa Fe, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed Nov. 28, 1975, Ser. No. 636,244

Int. Cl.² E04H *12/02;* **F16B** *7/08;* **F16D** *1/02*

U.S. Cl. 52—649 **10 Claims**

1. A mast suitable for use in drilling oil wells which comprises:

a plurality of elongated tubes arranged in a generally adjacent and coextensive arrangement;

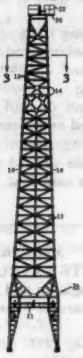
each of said tubes comprising parallel contiguous high strength fibers running substantially parallel to the tube axis, said fibers embedded in a supporting matrix;

a plurality of spaced collars bonded to the exterior of each tube;

first and second split rings installed adjacent to the ends of each of said collars contiguous with the wall of said tube, each of the first and second split rings adapted to engage an end of said collar and extend radially outwardly beyond said collar;

a tubular main fitting body overlying each collar, having an inwardly extending flange at one end overlapping and engaging said first split ring, the outer surface of the other end of said fitting being externally threaded;

an internally threaded nut adapted to engage the main fitting threads; said nut having an inwardly extending flange overlapping and engaging said second split ring, so that as said nut and main fitting are threaded together, said main fitting flange and nut flange are drawn together,



pressing the split rings against said collar and securing said fitting in place on said tube and;

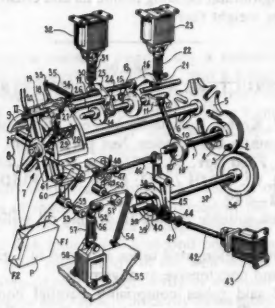
structural means fastened to various of said main fitting bodies, to connect fittings on adjacent tubes together in a high strength, truss-like arrangement.

3,984,963

DEVICE FOR SEALING OVERWRAPS OF PACKAGES

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy

Filed June 24, 1975, Ser. No. 589,879
Claims priority, application Italy, July 10, 1974, 3437/74
Int. Cl.² B65B *51/14*
U.S. Cl. 53—77 **7 Claims**



1. A device for sealing seams of thermoplastic overwraps on packets, comprising;

transferring means movable for transferring packets along a path at a plurality of operating speed levels subject to periodic halts, receptive during each halt of a packet and of a thermoplastic overwrap sheet at a first station for wrapping the packet in the sheet and thereby providing a seam between different portions of the sheet on the packet, the transferring means having a plurality of overwrap sealing stations spaced apart from the first station and from one another along said path;

a plurality of sealing contrivances, each located in a position adjacent to one of the sealing stations, all contrivances being mounted for movement relative to said seam, and each contrivance being mounted to effect said movement thereof into and away from contact with said seam, in the respective sealing station;

a plurality of supports, one for each sealing contrivance, for supporting it in said position and for effecting said movement;

a plurality of control cams, one for each support, each being movable in synchronism with the transferring means and each having linkage means for reciprocably shifting the respective support to effect said movement, during each halt of the transferring means; and

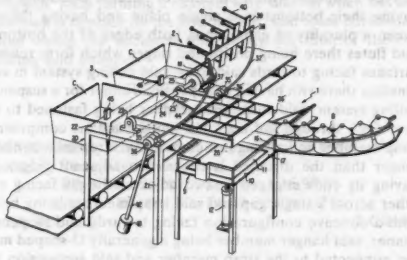
means for tripping the linkage means of at least one of the control cams in response to changes of said speed levels to keep the total time of contact of the sealing contrivances with said seam substantially constant regardless of the changes of said speed levels.

3,984,964

BOTTLE PACKING SYSTEM

Paul Stoll, Etobicoke, Canada, assignor to Bristol-Myers Canada Limited, Toronto, Canada

Filed Sept. 15, 1975, Ser. No. 613,606
Int. Cl.² B65B *21/06, 35/40*
U.S. Cl. 53—161 **14 Claims**



1. A bottle packing system including:

A. a frame having at least one bottle-receiving aperture therein:

B. resilient means in said aperture for retaining a bottle in said aperture;

C. means mounting said frame for oscillation about an axis between a first bottle-receiving position and a second bottle-ejection position;

D. ejection means including an ejector member for ejecting the bottle from the aperture at said second position, wherein said ejection means includes a hoop member carrying said ejector member, means mounting said hoop member for oscillation on an axis parallel to and offset from the axis of oscillation of said frame; and

E. bottle insertion means for inserting a bottle into said aperture.

3,984,965

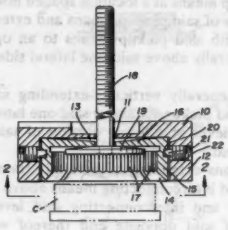
DEVICE FOR APPLYING CAPS TO BOTTLES

Rudolph Sonnenberg, Belvidere, Ill., assignor to Harry Crisci, New Castle, Pa.

Filed Sept. 19, 1974, Ser. No. 507,578
Int. Cl.² B67B *3/20;* **B65B** *7/28*
U.S. Cl. 53—331.5 **5 Claims**

1. A device for engaging the exterior of an internally threaded bottle cap and turning it on to the threaded finish of a bottle comprising a horizontally disposed support member having a depending annular flange on its peripheral edge, a plurality of segments arranged in spaced relation in a circle within said annular flange, each segment having a substantially

horizontal portion, the outer edge of which is curved to correspond to said circle and a similarly curved substantially vertical portion depending therefrom, inwardly extending pivots adjustably positioned in apertures in said depending flange, said pivots being circumferentially spaced and each positioned for engagement with an aperture in said curved vertical portion of one of said segments, an actuating member underlying the horizontal portions of said segments and arranged for



movement toward and away therefrom so as to move said horizontal portions of said segments upwardly and said depending portions of said segments inwardly into engagement with said bottle cap, and wherein said horizontal portions of said segments are arranged to move downwardly by gravity when disengaged by said actuating member so as to move said depending portions radially outwardly away from said bottle cap.

3,984,966

HARVESTING MACHINE EQUIPPED WITH A STALK CUTTER

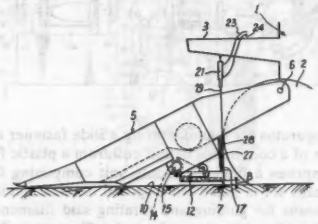
Raymond M. C. Outtier, Willems, France, assignor to International Harvester Company, Chicago, Ill.

Filed June 27, 1975, Ser. No. 590,907

Claims priority, application France, June 27, 1974, 74.22435

Int. Cl.² A01D *75/28*

U.S. Cl. 56—10.2 **10 Claims**



1. In a combine type of harvesting machine having a corn head and platform pivotally mounted below an operator's station and the corn head having a depending stalk cutter carried between two successive row divider points, and the stalk cutter having a housing comprising closed top and parallel side walls and an open front and bottom sides and including a rear wall having a discharge opening, and a cutter rotor rotatably mounted in the housing and having knives rotatable on a plane substantially parallel with a second plane passing through the open bottom side of the housing, wherein the improvement comprises:

a transverse shaft carried on the bottom side of the corn head and platform;

a pair of axially spaced swinging arms mounted to the shaft, the side walls of the housing pivotally mounted to the swinging end of the arms;

an attitude adjustment means having one end connected to the housing and an opposite end connected to the combine for swinging and housing about the axis of its pivotal connection to the arms and selecting the inclination of the plane of the knives with respect to the ground;

a first support means being a stretchable link connecting the housing rearwardly of its pivotal connection to the arms to the corn head and platform;

a second support means being a non-stretchable link of a predetermined length connected in parallel with the first support means for limiting the elongation of the first support means and for supporting the housing at the point of the limited elongation; and

a ledger blade means carried on the bottom of one of the side walls adapted to cooperate with the knives for comminutating the stalk cut by the knives.

3,984,967

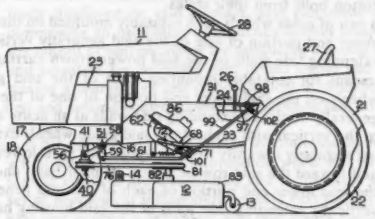
MECHANICAL SAFETY INTERLOCK FOR PREVENTING MOWER OPERATION DURING REVERSE TRAVEL

Kenneth R. Jones, Thiensville, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 22, 1975, Ser. No. 643,314

Int. Cl.² A01D *75/20*

U.S. Cl. 56—11.8 **8 Claims**



1. In a tractor and mower combination including a power unit, a drive train to ground engaging wheels including a forward-reverse transmission and a drive train to the mower including a clutch, an interlock for preventing operation of the mower during reverse travel comprising:

a manual transmission control for said transmission shiftable between forward and reverse positions wherein forward and reverse directions of travel of said tractor are effected,

a manual clutch control shiftable between clutch engaged and clutch disengaged positions and,

mechanical means interconnecting said clutch and transmission controls preventing shifting of said transmission control to its reverse position when said clutch control is in its clutch engaged position and preventing said clutch control from being moved to its clutch engaged position when said transmission control is in its reverse position.

3,984,968

COTTON STRIPPING APPARATUS

Lambuth G. Fowler, 2506 - 46th St., Lubbock, Tex. 79413

Filed Feb. 3, 1975, Ser. No. 546,739

Int. Cl.² A01D *46/12*

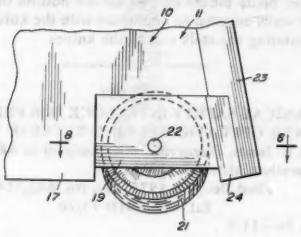
U.S. Cl. 56—33 **3 Claims**

1. Cotton stripping apparatus comprising:

a. a wheel-bearing power-drawn carriage adapted to be drawn along an upraised cotton-bearing earthen mound over rows of cotton-bearing stalks growing thereon;

b. a housing on the said wheel-bearing power-drawn supporting carriage having
1. spaced generally vertically extending side walls each having
a. a lower end portion;
2. an open front; and
3. means for directing the stripped cotton bolls into a trailer wagon or into a cotton receiving basket disposed rearwardly of the said power-drawn supporting carriage;

c. a row of cotton stripper bars mounted in coplanar spaced relationship on the lower end portion of the said supporting carriage between the said lower end portions of the said generally vertically extending side walls and extending forwardly at the said open front of the said housing and adapted to travel along rows of cotton stalks on the



said upraised cotton-bearing earthen mound to strip the cotton bolls from their stalks;

d. a pair of guide wheels each rotatably mounted on the said lower end portion of one of the said generally vertically extending side walls of the said power-drawn carriage;

e. means for rotatably mounting each of the said guide wheels on the said lower end portion of one of the said generally vertically extending side walls at an acute angle to the vertical with each of the said guide wheels extending angularly inwardly from its upper end to its lower end and toward the said row of cotton stripper bars; and

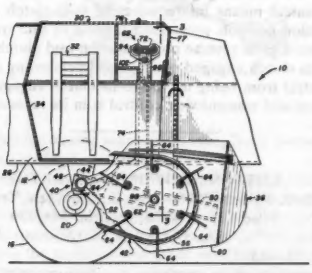
f. the said lower end portion of each of the said generally vertically extending side walls of the said housing having the form of a flange member extending downwardly and inwardly from the corresponding one of the said generally vertically extending side walls toward the said row of cotton stripper bars.

3,984,969

BALER PICKUP COUNTERBALANCING MEANS

George E. Yatcilla, Newton, Kans., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Sept. 15, 1975, Ser. No. 613,154
Int. Cl.[2] A01D *39/00*
U.S. Cl. 56—341 **12 Claims**



1. In a baler having a mobile frame adapted to move across a field, means on said frame operable to receive crop material and form said material into bales and a pickup assembly including pivot means on said frame and pickup means disposed generally forwardly of said pivot means and operable to pick up crop material from the field and feed said material to said receiving and forming means, said pickup means being connected to said pivot means for vertical swinging movement about a generally horizontal axis defined by said pivot means, an improved means to counterbalance said pickup means comprising:

a lever pivotally mounted at one end on said frame above said pickup means at a location spaced inwardly from one lateral side of said pickup means and extending generally parallel with said pickup means to an opposite end located generally above said one lateral side of said pickup means;

elongated, generally vertically-extending means interconnecting said pickup means at said one lateral side thereof with said lever at a lower portion of said opposite end thereof; and

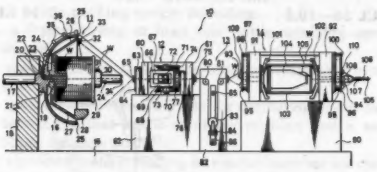
resilient means extending in generally transverse relationship to said interconnecting means above said one end of said lever and interconnecting said lever at an upper portion of said opposite end thereof with said frame between said one end of said lever and an opposite end of said pickup means so as to substantially uniformly counterbalance a substantial portion of the weight of said pickup means to enable said pickup means to flotatively follow the contour of the field during movement of said mobile frame across the field.

3,984,970

METHOD AND APPARATUS FOR MANUFACTURING HELICALLY COILED COUPLING ELEMENTS FOR SLIDE FASTENERS

Fumio Terada; Shigenori Omori; Kihei Takahashi, and Hiroshi Ida, all of Uozu, Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Aug. 27, 1975, Ser. No. 608,022
Claims priority, application Japan, Sept. 5, 1974, 49-102232; Sept. 5, 1974, 49-102233; Sept. 5, 1974, 49-102236
Int. Cl.[2] B29D *5/00*
U.S. Cl. 57—1 R **6 Claims**



2. An apparatus for manufacturing a slide fastener element in the form of a continuous helical coil from a plastic filament which comprises a filament supply unit comprising filament storing means set in place but disposed for free rotation and rotating means for guiding and rotating said filament, while being advanced, on its own axis, and a filament coiling unit where the filament is coiled, said filament being rotated on its own axis at the same rate and in the same direction as the filament is coiled at said filament coiling unit.

3,984,971

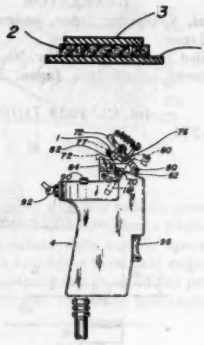
LID FOR PNEUMATIC YARN SPLICER

Fred White Lenoir, Hopewell, and Bertrem Charles Wheeler, Chester, both of Va., assignors to Allied Chemical Corporation, Petersburg, Va.

Filed Feb. 24, 1975, Ser. No. 552,397
Int. Cl.[2] D01H *15/00*
U.S. Cl. 57—22 **3 Claims**

1. In an apparatus for air splicing together two multifilament yarns comprising a splicing box having extending axially there-

through a passage open at both ends, opposite end portions of said passage having a narrow notch for receiving the yarns to be spliced in superposed overlapping relation, the intermediate portion of said passage being of enlarged cross section forming a splicing chamber; an input connection for compressed air; a laterally-narrow axially-disposed slot extending from said compressed-air input connection to said splicing



chamber for injecting a narrow wedge of compressed air through said superposed yarns to spread apart the filaments thereof at said injection point, said compressed air then exhausting through said chamber in opposite axial directions, the improvement comprising

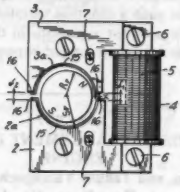
said chamber being entirely smooth-surfaced and non-resilient on any interior surface which can contact said yarns.

3,984,972

TRANSDUCER FOR QUARTZ CRYSTAL TIMEPIECE

Masahito Yoshino, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 4, 1975, Ser. No. 565,333
Claims priority, application Japan, Apr. 4, 1974, 49-38371
Int. Cl.² G04C *3/00*
U.S. Cl. 58—23 D **3 Claims**



1. A step motor transducer particularly suited for use in an electronic timepiece comprising in combination a permanent magnet rotor having two opposite polarity poles, said rotor being formed with respect to said mechanical axis to define at least two concentric circular equal radii surfaces having a radius Rr, and stator means including two stator poles having a common coil wrapped therearound, said stator poles having two symmetrical equal radii semi-circular stator surfaces having a radius Sr surrounding said rotor, each said stator pole including end surfaces, said respective stator pole end surfaces being disposed in facing relationship with respect to each other to define gaps δ_1 and δ_2 therebetween, said rotor radii, stator radii and gaps between said stator pole end surfaces having the following relationship:

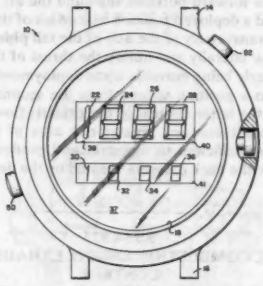
$$1.2 \leq (\delta_1+\delta_2)/(Sr-Rr) \leq 2.4$$

3,984,973

DIGITAL WATCH WITH LIQUID CRYSTAL AND LIGHT EMITTING DIODE DISPLAYS

Ernest C. Ho, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 410,744, Oct. 29, 1973, abandoned.
This application Mar. 13, 1975, Ser. No. 558,183
Int. Cl.² G04B *19/30, 19/24*
U.S. Cl. 58—50 R **7 Claims**



1. A digital watch for displaying selectable horological information comprising:

first and second optical displays;

an electronic circuit for providing information to be selectively displayed on said displays, said electronic circuit comprising an oscillator, a frequency divider coupled to the output of said oscillator for producing a timing signal, and counters for receiving said timing signal and maintaining a plurality of sets of horological information;

a first and second control connected between said counters and said displays;

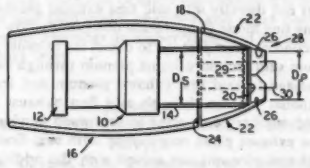
means for causing said first display to continuously display a first set of horological information when said first and second controls are unactivated and to display a second set of horological information on said first display when said first control is activated, also said means causes said second display to display said first set of horological information when said first and second controls are simultaneously activated.

3,984,974

THRUST SPOILING APPARATUS AND METHOD

George E. Medawar, San Diego, and Felix Hom, La Mesa, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Nov. 29, 1972, Ser. No. 310,339
Int. Cl.² F02K *1/20*
U.S. Cl. 60—230 **7 Claims**



1. Apparatus for spoiling the thrust of a turbojet engine having a rearwardly discharging turbine tail pipe projecting directly rearwardly from the engine while maintaining a substantially constant mass flow through the tail pipe, comprising: a secondary nozzle forming the fixed exit of the tail pipe and having an exit area a predetermined amount greater than that

required to provide a predetermined mass flow during normal engine operation; a stowable and deployable primary nozzle converging rearwardly and having an entry area equal to the exit area of the secondary nozzle and a smaller exit area sized to provide said predetermined mass flow during normal engine operation; the primary nozzle having a stowed position concentric with the secondary nozzle and with its entry end at the plane of the secondary nozzle exit to form a directly continuous extension thereof with gradually reducing area; and a plurality of deflector doors having a stowed position in which at least their forward portions surround the aft portion of the tail pipe and a deployed position spaced aft of the tail pipe and extending transversely of the axis of the tail pipe to deflect the exhaust flow laterally and nullify the thrust of the engine; the primary nozzle being movable upon deployment of the deflector doors to a position spaced from the secondary nozzle to transfer to the latter control of the exhaust flow from the tail pipe; the predetermined greater exit area of the secondary nozzle being sufficient to maintain said predetermined mass flow despite the back pressure created by the deployed deflector doors.

3,984,975

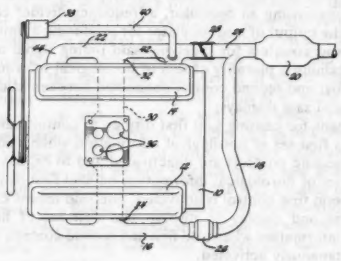
INTERNAL COMBUSTION ENGINE EXHAUST EMISSION CONTROL

Robert T. Price, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1975, Ser. No. 630,197

Int. Cl.² F02B 75/10

U.S. Cl. 60—274 **3 Claims**



1. The method of controlling exhaust emissions from an internal combustion engine having first and second exhaust plenums receiving exhaust gases from the engine, a crossover passage interconnecting said plenums, a main converter for promotion oxidation of exhaust gases, first and second exhaust passages respectively connecting said first and second exhaust plenums to said main converter, and an auxiliary converter in said first exhaust passage for promoting oxidation of exhaust gases, said method comprising the steps of:

delivering additional air into said second exhaust plenum but not directly into said first exhaust plenum, and

during one mode of operation obstructing flow through said second exhaust passage to direct the exhaust gases and air from said second exhaust plenum through said crossover passage to said first exhaust plenum and from said first exhaust plenum through said first exhaust passage and said auxiliary converter to said main converter whereby the exhaust gases received in both said first and second exhaust plenums are mixed with the additional air and oxidized in both said auxiliary and main converters, and

during another mode of operation permitting flow from said first and second exhaust plenums through said first and second exhaust passages respectively directly to said main converter whereby the exhaust gases received in said first exhaust plenum are oxidized in said auxiliary converter substantially without the additional air to limit oxidation in said auxiliary converter and whereby the exhaust gases received in both said first and second exhaust plenums are mixed with the additional air and oxidized in said main converter.

3,984,976

AIR-FUEL RATIO CONTROL SYSTEM FOR AUTOMOTIVE ENGINE WITH COMPENSATION CIRCUIT FOR DETERIORATION OF FEEDBACK SIGNAL GENERATOR

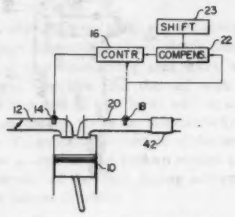
Tadashi Nagai, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed June 13, 1975, Ser. No. 586,619

Claims priority, application Japan, June 17, 1974, 49-71103[U]

Int. Cl.² F02B 75/10

U.S. Cl. 60—274 **15 Claims**



1. In a system for controlling the air-fuel ratio of a combustible mixture fed to an internal combustion engine carried on a motor vehicle, the system having a fuel supply means for supplying a fuel at a variable rate to a means for preparing a combustible mixture of air and fuel, a sensor which is exposed to the exhaust gas of the engine and develops an electrical signal representing the concentration of a component of the exhaust gas, the concentration being correlated to the air-fuel ratio of the combustible mixture, and a control means for regulating the fuel supply rate from the fuel supply means on the basis of the electrical signal fed thereto from the sensor, the improvement comprising a compensation means for compensating for variations in the level of said electrical signal arranged between said sensor and said control means and a shift means for gradually varying a characteristic value of said compensation means in correlation to total running hours of said engine and at such a rate that variations in said characteristic value compensate for variations in the level of said electrical signal caused by a prolonged exposure of said sensor to the exhaust gas.

3,984,977

EXHAUST PORT ARRANGEMENT IN COMBUSTION ENGINE

Yasuyuki Morita, and Takuso Yamaguchi, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Filed Aug. 25, 1975, Ser. No. 607,822

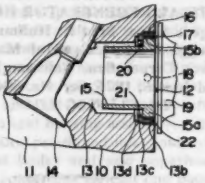
Claims priority, application Japan, Oct. 9, 1974, 49-122053[U]

Int. Cl.² F01N 3/10

U.S. Cl. 60—282 **5 Claims**

1. In a combustion engine comprising an engine casing, at least one combustion chamber formed in said engine casing, and at least one exhaust passage extending from said combustion chamber to an exhaust port formed in said engine casing for discharge of an exhaust gas, generated in said combustion chamber, by means of an exhaust manifold connected to said engine casing in alignment with said exhaust port, the improvement which comprises a substantially tubular insert having one end formed with a radially outwardly extending flange; said exhaust passage having one end adjacent said exhaust port radially outwardly indented to provide at least

one bore and an annular land, said annular land being defined by the difference in diameter between said bore and the remaining portion of said exhaust passage; an annular heat insulating member adapted to be held in position between said annular land and said flange within said exhaust passage, the other end portion of said exhaust passage extending towards



said combustion chamber with said radially outwardly extending flange situated within said bore; and a plurality of mounting pins inserted in substantially equally spaced relation to each other and each extending from said engine casing into said flange of said tubular insert to avoid any possible relative rotation of said insert with respect to said engine casing.

3,984,978

AUXILIARY FRONT WHEEL DRIVE

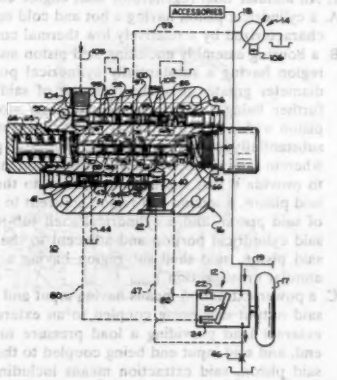
Loren L. Alderson, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Hutchinson, Kans.

Filed Nov. 22, 1974, Ser. No. 526,445

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² F16H *39/46*

U.S. Cl. 60—422 **8 Claims**



1. An auxiliary hydraulic drive system on a vehicle principally driven by other means, the vehicle having a primary hydraulic system including an engine driven variable displacement pressure compensated pump which supplies the various conventional accessories of the vehicle, the improvement comprising:

a variable displacement motor having a pressure compensating control means connected in driving relation with the primary pump, the motor driving at least one non-mechanically driven wheel on the vehicle, the pressure compensator means on the motor being set at a pressure level less than the pressure compensating level on the primary pump; thereby destroking the motor when the system pressure drops below said lesser value, the lesser pressure compensating level of the motor being sufficient to supply the conventional accessories of the vehicle whereby said accessories have a priority requirement over the drive motor.

3,984,979

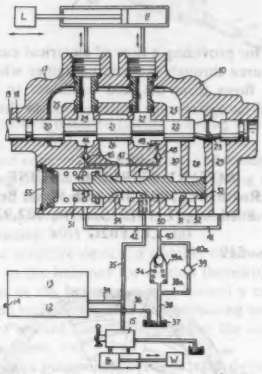
LOAD RESPONSIVE FLUID CONTROL VALVES

Tadeusz Budzich, 80 Murwood Drive, Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 377,044, July 7, 1973, Pat. No. 3,882,896. This application Mar. 19, 1975, Ser. No. 559,818

Int. Cl.² F16H *39/46*

U.S. Cl. 60—445 **36 Claims**



1. A valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second fluid load chambers, a fluid outlet chamber, a fluid exhuast chamber, and fluid exhaust means, first valve means for selectively interconnecting said fluid load chambers with said fluid supply chamber and said fluid outlet chamber, variable fluid metering means between said fluid exhaust chamber and said fluid exhaust means, first throttling means responsive to pressure in said exhaust chamber and operable to control fluid flow from said fluid inlet chamber to said fluid supply chamber to maintain said pressure in said fluid exhaust chamber at a first relatively constant preselected level when one of said fluid load chambers in interconnected with said fluid outlet chamber and when pressure in said outlet chamber is at said first relatively constant preselected level, and second throttling means responsive to pressure in said fluid exhaust chamber and operable to control fluid flow from said fluid outlet chamber to said fluid exhuast chamber to maintain said pressure in said fluid exhaust chamber at a second relatively constant preselected level when one of said fluid chambers is interconnected with said fluid outlet chamber and when pressure in said fluid outlet chamber is higher than said second preselected pressure level.

3,984,980

INTEGRAL HEATER THERMAL ENERGY STORAGE DEVICE

Joseph Wise, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

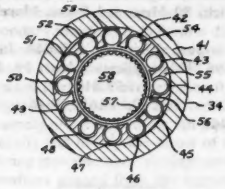
Filed Aug. 5, 1975, Ser. No. 602,039

Int. Cl.² F02G *1/04*; H05B *3/14*

U.S. Cl. 60—517 **3 Claims**

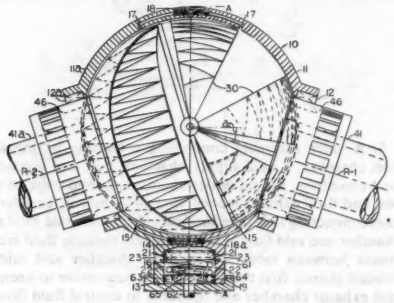
1. An integral heater thermal energy storage device for providing continuous thermal energy to a user system from an interrupted electrical power source comprising:

a. a heat pipe for conducting thermal energy to the said user system;
b. thermal energy storage material contained in an electrical said heat pipe; and



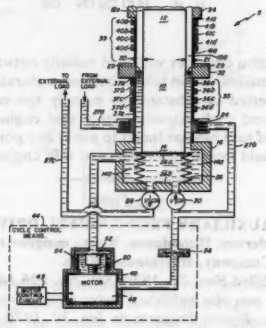
c. means for providing a flow of electrical current from the said source through the said container whereby thermal energy flows from the said container to both the said thermal energy storage material and to the said user.

3,984,981
ROTARY STIRLING ENGINE
Charles G. Redshaw, 15001 SE. 44th Place, Bellevue, Wash.
Filed Aug. 7, 1975, Ser. No. 602,923
Int. Cl.² F02G *1/04*
U.S. Cl. 60—519 **9 Claims**



1. A rotary Stirling cycle engine with means for internal heat transfer, comprising:
a housing fixed against rotation and having spherical internal surfaces;
two support shafts of hollow construction rotatably mounted by bearing means located nonaxially in said housing between one and two right angles apart, the center-line of said shafts intersecting at a point coincident to the center of said housing;
a spherical wedge shaped rotor mounted on each said shaft having the wedge lune juxtapose to and in sealing contact with said housing interior;
said rotors having a plurality of hollow sector shaped fins arranged with the centerline of the sector radii perpendicular to said shaft centerline and connected by a common manifold to provide fluid passage through said shaft and fins;
a circular disk positioned between and rotatably connected to said rotors by bearing means located on two major diameters of the disk at right angles, to form a universal coupling with said rotors, and defining four separate chambers with displacement variable by the relative motion of the disk to the rotors, and having sealing engagement with said housing and rotors;
said disk having two sets of porous hollow fins on each side for complementary engagement with said rotor fins, each set of which is connected by a common manifold through passages in the disk to one of the sets on the opposite side, forming two interconnected pair of fin sets, each pair providing fluid passage between one pair of said chambers.

3,984,982
ANNULAR TIDAL REGENERATOR HEAT ENGINE
Kenneth G. Hagen, Acton; Fred N. Huffman, Sudbury, and Arthur E. Ruggles, Billerica, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.
Filed June 6, 1975, Ser. No. 584,317
Int. Cl.² F02G *1/04*
U.S. Cl. 60—520 **14 Claims**



1. An annular tidal regenerator heat engine comprising:
A. a cylindrical piston having a hot and cold end and being characterized by a relatively low thermal conductivity,
B. a housing assembly enclosing said piston and an interior region having a substantially cylindrical portion with a diameter greater than the diameter of said piston, and further being adapted for translational motion of said piston within said cylindrical portion, said motion being substantially coaxial with said cylindrical portion, and wherein said piston is arranged within said interior region to provide a first sub-region adjacent to the hot end of said piston, a second sub-region adjacent to the cold end of said piston, and a cylindrical shell sub-region within said cylindrical portion and adjacent to the sidewalls of said piston, said shell sub-region having a substantially annular cross-section,
C. a power extraction means having input and output ends, said output end being coupled to an external load said external load providing a load pressure to said output end, and said input end being coupled to the cold end of said piston, said extraction means including means for varying the volume of said sub-region adjacent to said hot end of said piston in response to the pressure differential applied across said input and output ends,
D. a condensable vapor serving as a working fluid and disposed in said sub-regions,
E. a super-heater positioned near said first sub-region, said superheater including means to maintain the adjacent region within said housing assembly at a superheater temperature, said super-heater temperature being above the boiling point for said fluid at a predetermined maximum vapor pressure,
F. a condenser positioned near said second sub-region, said condenser including means to maintain the adjacent region within said housing assembly at a condenser temperature, said condenser temperature being below the boiling point of said working fluid at a predetermined minimum vapor pressure,

G. a boiler positioned near said cylindrical portion of said housing assembly between said superheater and said condenser, said boiler including means to maintain the adjacent region within said housing assembly at a boiler temperature, said boiler temperature being less than said super-heater temperature and greater than or equal to the boiling point of said fluid at said predetermined maximum vapor pressure,

H. liquid regenerator positioned near said cylindrical portion between said condenser and said boiler, said liquid regenerator comprising at least one passive heat storage element and providing means for maintaining a predetermined temperature gradient between said condenser temperature and said boiling temperature in the adjacent region within said housing assembly,

I. vapor generator positioned near said cylindrical portion between said boiler and said superheater, said vapor regenerator comprising at least one passive heat storage element and providing means for maintaining a predetermined temperature gradient between said boiler temperture and said super-heater temperature in the adjacent region within said housing assembly,

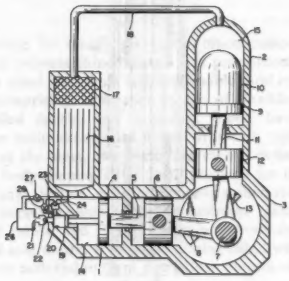
J. a cycle control means for establishing a cyclical sequence of locations for the level of said working fluid in its liquid phase, said locations lying between and including the region characterized by said boiler temperature and the region characterized by said condenser temperature.

3,984,983

POWER CONTROL COMPRESSOR ARRANGEMENT IN HOT GAS ENGINE

Karl Olof Ragnar Gronvall, Borensberg, Sweden, assignor to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Aug. 7, 1975, Ser. No. 602,734
Int. Cl.² F02G 1/06
U.S. Cl. 60—521 **5 Claims**



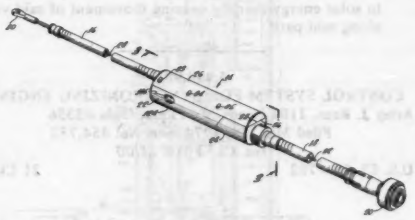
1. A hot gas engine of the type comprising a first piston adapted to reciprocate in a first cylinder which is kept at a lower temperature level and a second piston adapted to reciprocate in a cylinder which is kept at a higher temperature level, the said two pistons forming walls of an enclosure containing a working gas charge, said enclosure also comprising a cooler, a regenerator and a heater, characterized in that said two pistons are disposed for movement in different directions by a common crank shaft and said cooler is disposed adjacent said first cylinder, a compressor pump having a cylinder is provided for pumping gas from said charge into a gas reservoir, the said first piston at its upper side operates a plunger working in said pump cylinder, a first check valve governed conduit is disposed from said pump cylinder to said gas reservoir and a second check valve governed conduit is disposed from a part of said enclosure located between said cooler and said first piston to said pump cylinder.

3,984,984

CONTROLLED ACTUATOR

Francois X. Chevrier, Santa Ana, and Phillip L. Cogswell, Tustin, both of Calif., assignors to Francois X. Chevrier, Santa Ana, Calif.

Filed Dec. 20, 1974, Ser. No. 535,014
Int. Cl.² F01B 29/08; F02N 13/00
U.S. Cl. 60—632 **13 Claims**



1. In an explosive initiator having a spring driven hammer for detonating a cartridge, a cocking mechanism for cocking the hammer and compressing the spring, and means for releasing the cocking mechanism to permit the spring to drive the hammer toward the cartridge, the improvement comprising

a pressure sensitive control for the hammer, said control including

a pressure sensitive device, a slidably mounted sear connected to the hammer for motion therewith to a latch position as the hammer moves toward a cocked position, and including means for restraining motion of the hammer toward said cartridge when the sear is in said latch position, and

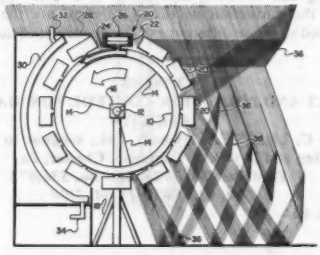
trigger means interposed between said device and said sear and operable under control of said device for restraining motion of said sear from said sear latch position.

3,984,985

SOLAR ENGINE

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Apr. 17, 1975, Ser. No. 569,008
Int. Cl.² F01K 7/02, 7/06
U.S. Cl. 60—641 **10 Claims**



1. A solar engine comprising:

a vessel disposed for movement along a predetermined path and containing a first relatively non-expandable fluid;

a plurality of expandable and contractable chambers each disposed at a successive spaced interval along said vessel, and each containing a second relatively expandable and contractable fluid;

means for supporting said vessel for motion along said path;

means for cooling the chambers disposed along a predetermined section of said vessel to maintain the chambers in

this section at a lower temperature than the temperature of those chambers exposed to solar energy;

the chambers exposed to solar energy being expandable in response to heating of said second fluid contained therein, the expansion of said chambers causing displacement of said first fluid in the section of said vessel exposed to solar energy and conveyance of said first fluid into the cooled section of said vessel;

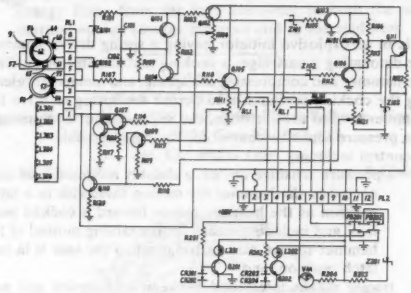
said cooled section being heavier than the section exposed to solar energy thereby causing movement of said vessel along said path.

3,984,986

CONTROL SYSTEM FOR SYNCHRONIZING ENGINES

Arley J. Reas, 1102 Lenox St., Piqua, Ohio 45356

Filed Mar. 25, 1974, Ser. No. 454,752
Int. Cl.² F01B 21/00
U.S. Cl. 60—702 **21 Claims**



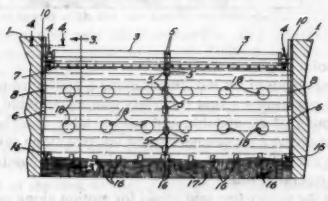
1. Apparatus for use in correcting speed and/or phase differences between a master engine and at least one slave engine characterized by means for connection to said master and said slave engines operative to sense and continuously compare the speed and phase relation thereof comprising means producing an output signal corresponding to any difference in the speed and/or phase relation of said master and said slave engines, in the operation thereof, said last named means including means effective to produce said signal in a modulated form in the event that the difference in the speed or out-of-phase relation of said engines is below a predetermined level, and means for receiving and directing said signal in a form applicable to induce the correction necessary to eliminate the indicated speed and/or phase difference in the operation of said engines.

3,984,987

SILT AND POLLUTION CONTROL FOR MARINE FACILITY

Stanley C. Light, Jr., Claymont, Del., assignor to Sun Shipbuilding and Dry Dock Company, Chester, Pa.

Filed Dec. 24, 1974, Ser. No. 536,073
Int. Cl.² E02B 15/04, 3/04
U.S. Cl. 61—1 F **3 Claims**



1. An apparatus for a marine facility for preventing silt from entering the facility and providing spill containment comprising:

a. fixed structure to which a ship can tie up;

b. barrier floating on water and enclosing an area between it and the fixed structure whereby a spill is contained within the area;

c. flexible curtain attached to the barrier and extending downward to floor of a water body and having anchoring means holding the curtain to the floor of the water body whereby silt is prevented from entering the contained area and the curtain having openings within the curtain whereby tidal flow can enter and leave the contained area;

d. vertical and horizontal moving mounting means attaching the barrier to the fixed structure whereby the barrier is permitted to rise and fall with the tide and both the barrier and curtain can be moved vertically or horizontally to permit passage of a ship;

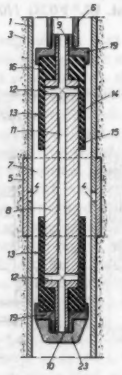
e. moving means for vertically or horizontally moving the barrier to permit passage of a ship and again enclosing the contained area.

3,984,988

OBTURATING DEVICE, ESPECIALLY FOR INJECTION TUBES

Jean-Louis Portier, Paris, France, assignor to Soletanche, Paris, France

Filed Oct. 23, 1975, Ser. No. 625,080
Claims priority, application France, Nov. 7, 1974, 74.36922
Int. Cl.² E02D 5/00
U.S. Cl. 61—35 **10 Claims**



1. Obturating device for injection tubes or the like cavities comprising in combination a hollow body adapted to be connected to a duct for feeding into said body a fluid under pressure to be injected, said body being provided with at least an outlet port for said fluid; a flexible and resilient sleeve tightly engaged over one end of said body and covering said outlet port, said sleeve being provided with a relatively thick bottom located between said one end of said body and a backing-piece secured to said body, the assembly of said body, said sleeve and said backing-piece being adapted to be introduced in a cavity to be obtured with a clearance sufficiently small that the deformation of the bottom of said sleeve under the effect of the pressure of said fluid ensures the obturation of said cavity.

3,984,989

MEANS FOR PRODUCING SUBAQUEOUS AND OTHER CAST-IN-PLACE CONCRETE STRUCTURES IN SITU

Lee A. Turzillo, 2078 Glengary Road, Akron, Ohio 44313

Continuation of Ser. No. 344,695, March 26, 1973, which is a division of Ser. No. 44, Jan. 24, 1970, Pat. No. 3,726,950, which is a continuation-in-part of Ser. No. 647,026, June 19, 1967, abandoned, which is a continuation-in-part of Ser. No. 365,431, May 6, 1964, Pat. No. 3,345,824. This application Jan. 17, 1975, Ser. No. 542,050

The portion of the term of this patent subsequent to Oct. 10, 1984, has been disclaimed.

Int. Cl.[2] E02B *1/00;* E02D *5/00, 5/18*

U.S. Cl. 61—35 11 Claims

1. A device for molding a cast-in-place concrete or like structure of predetermined shape and proportions in a subaqueous or other situs from self-hardenable fluid cementitious material comprising: container means of flexible, generally porous-walled fabric, and a matrix frame having means thereon for maintaining said matrix frame in rigidly affixed condition at the situs, and including means defining fixedly restrained body-shaping cavity wall portions for limiting distension of said flexible, generally porous-walled fabric of said container means against tensional restraint maintained between said fabric and fixedly restrained body-shaping wall portions of said matrix frame upon being filled with the fluid cementitious material to form a structure therein of like shape and size.

3,984,990

SUPPORT MEANS FOR A WELL RISER OR THE LIKE

Howard W. Jones, Long Beach, Calif., assignor to Regan Offshore International, Inc., Torrance, Calif.

Filed June 9, 1975, Ser. No. 585,375

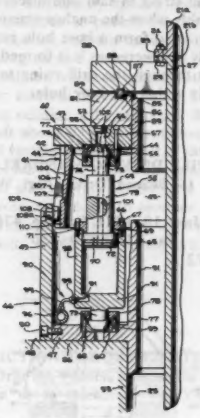
Int. Cl.[2] B63B *35/00;* E21B *15/02*

U.S. Cl. 61—99 18 Claims

1. In support means for a subsea well riser run in sections from a floating vessel to a subsea well and including a riser flange for supporting the upper end of the riser at said vessel, the improvement which comprises:

gimbal means disposed between said riser flange and said vessel for maintaining said riser suspended from said vessel in a generally vertical position during vessel movement, said gimbal means including an upper section in supporting relation with said riser flange and a lower section in supported relation to said vessel; and

hydraulically operated means associated with said gimbal



means for hydraulically supporting said upper section on said lower section of said gimbal means.

3,984,991

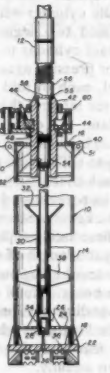
ANCHOR AND METHOD OF SETTING ANCHOR

Edmond Kagler, Jr., Houston, Tex., assignor to A-Z International Tool Company, Houston, Tex.

Filed Mar. 17, 1975, Ser. No. 559,054

Int. Cl.[2] B63B *21/00,* E02D *5/54;* E21B *7/12*

U.S. Cl. 61—99 12 Claims



1. The method of setting an anchor from a vessel floating in water, including the steps of

suspending below the vessel an anchor assembly having cutters on the lower end thereof and with a portion of a drill string operatively connected to said anchor assembly,

said drill string portion being connected to rotate said anchor assembly when rotated in one direction, to release therefrom when rotated in the opposite direction and sealing within said anchor assembly to render it watertight and buoyant when operatively connected thereto,

connecting additional lengths of drill string to the drill string portion while lowering the anchor assembly and drill string in the water,

rotating the drill string in said one direction of rotate the anchor assembly when the anchor assembly is in contact with the bottom to form a bore hole into which the anchor assembly is lowered as it is formed, and

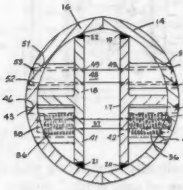
flowing cement through the drill string to cement the anchor assembly within the bore hole.

3,984,992

PILE DRIVING MANDREL

Stanley Merjan, 16 Beacon Drive, Port Washington, N.Y. 11050

Filed June 10, 1974, Ser. No. 478,028
Int. Cl.² E02D 7/30
U.S. Cl. 61—53.72 **3 Claims**



1. In an expansible pile-driving mandrel for use with a pile shell whose walls are incapable of withstanding the pile-driving forces, said mandrel having means for receiving the pile-driving forces and having two opposed elongated segments adapted to be positioned lengthwise vertically within said shell and to be pressed transversely against the inside of said shell to transmit said pile driving forces to said shell, each of said two segments having an arcuate perimeter spanned by a stiffening plate, the improvement wherein one of said two segments carries a hydraulic cylinder which passes through said plate of the other of said two segments, said cylinder has means for connecting said cylinder to a source of pressurized fluid and has a piston for pressing against one of said segments to expand said mandrel, each of said segments comprises an arcuate channel and a tee integral therewith, the arms of said tee comprising said plate, the ends of the arms of said tee being integrally secured, by welding, to said channel and the stem of said tee serving to stiffen said plate and extending into contact with said channel, there is a portion cut out of said tee of said other segment to receive said cylinder, and there are reinforcing means to thicken and strengthen said plate around said cut out portion, there being a plurality of said cylinders spaced vertically, along the length of said mandrel, about 3 to 15 feet apart, said cylinders having outside diameters of about 3 to 5 inches and there being a small clearance between each cylinder and the surrounding portion of said stiffening plate through which said cylinder passes whereby said cylinders are subjected to shearing forces during pile driving when said segments are not driven equally.

3,984,993

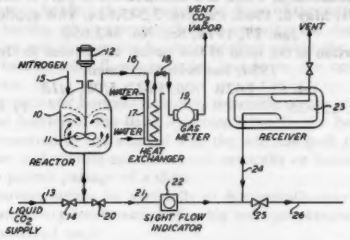
PRODUCTION OF A REFRIGERANT SLURRY BY CONTROLLED VENTING AND AGITATION OF A CARBON DIOXIDE BODY

Allen V. Muska, Berkeley Heights, N.J., assignor to Airco, Inc., Montvale, N.J.

Continuation of Ser. No. 258,962, June 2, 1972, abandoned. This application June 24, 1974, Ser. No. 482,116
Int. Cl.² F25J 1/00
U.S. Cl. 62—10 **16 Claims**

1. A process for the preparation of a pumpable carbon dioxide slurry which comprises

venting carbon dioxide vapor from a body of liquid carbon dioxide in equilibrium with solid and vapor carbon dioxide at the triple-point pressure and temperature in a reactor to cause discrete non-agglomerated particles of solid carbon dioxide to be formed at an evaporating surface of the liquid,



agitating said liquid carbon dioxide while venting said carbon dioxide vapor to prevent agglomeration of said discrete particles as a crust and to remove said solid carbon dioxide from said surface as non-agglomerated fine discrete particles which are submerged by said agitation in the body of said liquid thereby dispersing said discrete solid particles in said liquid to form a solid liquid slurry, and

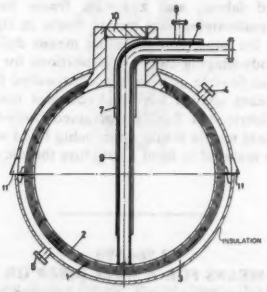
removing the solid-liquid slurry so formed from the reactor.

3,984,994

PROCESS AND DEVICE FOR FILLING MULTILAYER PRESSURE CONTAINERS

Joachim Ehle, Essen, and Karl-Friedrich Windgassen, Homberg, both of Germany, assignors to Messer Griesheim GmbH, Germany

Filed Dec. 5, 1972, Ser. No. 312,265
Claims priority, application Germany, Dec. 7, 1971, 2160640
Int. Cl.² F17C 7/02
U.S. Cl. 62—45 **2 Claims**



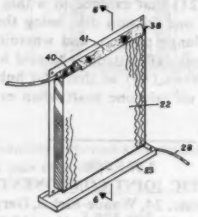
1. A multilayer pressure container comprising a plurality of individual metal shells adjacent one another. each shell in intimate contact throughout its surface with the adjacent shells surrounding it, a cooling chamber surrounding the individual shells having intake and outlet openings therein for circulating coolant through the cooling chamber for cooling the metal shells from the outside to the interior thereof prior to filling the container with cold liquid, insulation on the outside of the cooling chamber, and inlet and outlet means communicating with the interior of the container.

3,984,995

METHOD AND APPARATUS FOR THE TREATMENT OF AIR

Robert H. Starr, 938 Concorda Drive, Tempe, Ariz. 85282, and Robert L. Starr, 2354 W. Pampa Ave., Mesa, Ariz. 85202

Filed Mar. 12, 1975, Ser. No. 557,867
Int. Cl.² F28D 5/00
U.S. Cl. 62—305 9 Claims



5. In an air conditioning apparatus of the type having an efficiency which is reduced by the condensation of water droplets upon the cooling coils of the compressor, an apparatus for delivering a water cooled air stream to the air conditioning apparatus and for preventing water droplets from becoming a part of the air stream, the combination comprising:

effluent dispensing means for providing an effluent exuding at a controlled rate from said effluent dispensing means;

evaporator means having a plurality of interior surfaces, each of said interior surfaces operable to carry a portion of said effluent flow as well as to define a plurality of channels for conducting the air stream through said evaporator means; and

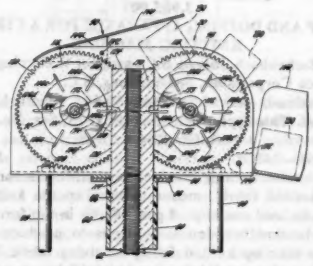
said evaporator means being in contact with said effluent dispensing means for transferring the exuding effluent from the dispensing means to the evaporator means while preventing water droplets from being picked up by said air stream.

3,984,996

VERTICAL TUBE ICE MAKER

James A. Bright, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 2, 1975, Ser. No. 564,314
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.² F25C 1/06, 1/12
U.S. Cl. 62—353 5 Claims



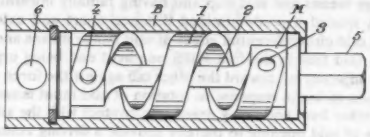
1. In an automatic ice piece maker, a vertically extending tubular member defining an ice forming chamber having an upper open end, said chamber having a non-circular cross section, means forming a water supply inlet to said chamber adjacent the lower end thereof, refrigeration means for freezing the water in said chamber, a threaded shaft rotatably mounted within said chamber, said shaft threads having their major diameter in sufficiently spaced relation to the inside surface of said chamber to permit the formation of an ice column therein, the ice column having a non-circular cross section conforming to the cross section of said chamber, whereby the ice column is locked against rotational movement in said chamber; internal threads being formed by the ice column in mating relation with said shaft threads, means for rotating said shaft about its axis of rotation whereby the ice column is moved vertically upward out of said chamber upper open end, and ice harvesting means above said chamber open end operative for successively removing a top portion from the upwardly driven ice column to produce substantially uniform ice pieces with each ice piece having a non-circular cross section substantially conforming to the cross section of said chamber.

3,984,997

FRICTION TORQUE LIMITERS

Michel Dossier, Orgeual, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Aug. 22, 1974, Ser. No. 499,599
Claims priority, application France, Aug. 30, 1973, 73.31476
Int. Cl.² F16D 3/14
U.S. Cl. 64—27 R 21 Claims



1. A rotary coupling of the torque limiting type comprising:

a pair of coaxial rotating bodies, one being a driving member and the other being a driven member arranged to be driven by the driving member, said bodies being mounted for rotation in either direction,

an at least partially deformable friction element operatively interposed between said pair of bodies such that the drive line along which the driving force is transmitted from the driving member to the driven member passes through friction engaging surfaces of said friction element, said friction element being arranged to slip when the torque required to turn the driven member exceeds a certain level,

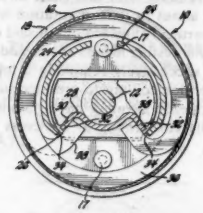
and including an elastic means operatively positioned in the drive line between the driving member and the friction element such that upon driving in one direction the driving force bypasses the elastic means and exerts its force directly on the friction element, and upon driving in the other direction the driving force from the driving member passes through the elastic means and then through the friction element such that the friction engagement characteristics of the friction element are different in the latter case as compared to the friction engaging characteristics when the elastic means is bypassed, whereby the slippage characteristics and hence also the limiting torque of the rotary coupling is different in one of said directions of rotation then in the other direction of rotation.

3,984,998

ENERGY ABSORBING COUPLING

Deno J. Rogakos, Kettering, and Lynn M. Johnston, West Milton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 12, 1975, Ser. No. 612,779
Int. Cl.² F16D 3/14
U.S. Cl. 64—27 C **5 Claims**



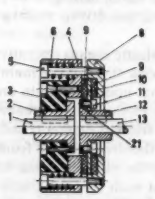
1. An energy absorbing coupling comprising a rotatable shaft, rotatable input and output means mounted on said shaft, one of said input and output means being secured to said shaft and the other being journaled thereon, a spring retainer cup secured to said input means, axial flange means operatively connected to said output means for rotation therewith and extending concentrically into said cup, a peripheral opening of a predetermined arcuate length formed in said axial flange means, radially extending spaced tabs secured to said input means and extending outwardly toward the respective circumferential edges of said peripheral opening in said flange means, and a torsion spring mounted in the radial space between said flange means and said cup and having radially inwardly bent ends spaced a predetermined distance apart and extending past said circumferential edges of said flange means and adjacent said tabs in the free state, one bent end being urged by said adjacent tab toward the other tab against the force of said torsion spring in response to rotation of said input means, and the other bent end being urged into contact with the adjacent edge of said opening to thereby provide a driving connection between said input and output means through said tabs, said torsion spring and said axial flange means, said one of said bent ends and said tab adjacent thereto continuing to move toward said other tab a distance sufficient to absorb the resultant energy once said output means encounters a stop condition.

3,984,999

FRICTION OVERLOAD COUPLING

Jean Ernst Kopp, Meyriez, Murten, Switzerland

Filed Nov. 7, 1974, Ser. No. 521,898
Claims priority, application Switzerland, Nov. 19, 1973, 16255/73
Int. Cl.² F16D 7/02
U.S. Cl. 64—30 C **8 Claims**



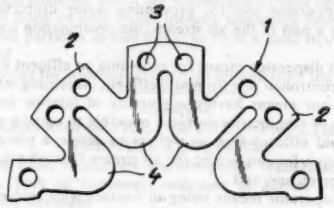
1. An elastic friction overhead coupling for operatively connecting two shafts (1, 13) and transmitting a rotational moment therebetween, comprising, in combination, a first coupling part arranged on one (13) of said shafts and having a hub portion (12) as well as at least one friction disc (9, 10, 18) located between two elements (4, 8, 17) of a second coupling part which is arranged on the other shaft (1), so that said friction discs transmit the rotational moment, compressed by spring means (6) that act in the axial direction on first screws (5) which surround said friction discs and which are arranged substantially parallel to the axes of said shafts, said friction discs being thus compressed, wherein the outer diameter of said hub portion is smaller than the inner diameter of said two elements, said hub portion has a somewhat protruding flange portion (21) that extends to within said two elements, said at least one friction disc being threadedly (11) engaged with said flange portion, and wherein said friction discs consist of sectors (10) attached to said hub portion by means of second screws (11) so that said hub portion may remain on its place on said one shaft when exchanging said friction discs.

3,985,000

ELASTIC JOINT COMPONENT

Helmut Hartz, Hedwistr. 24, Wanne-Eickel, Germany (4680)

Filed Sept. 12, 1975, Ser. No. 612,808
Claims priority, application Germany, Nov. 13, 1974, 2453688
Int. Cl.² F16D 3/58
U.S. Cl. 64—12 **8 Claims**



1. An elastic joint means for interconnecting a driving member and a driven member with limited relative angular and radial mobility, said joint means comprising a generally cylindrical stack of resilient, generally annular foils each forming an even number of peripherally equispaced webs separated by gaps and interconnected by flat integral links bridging said gaps, said webs being provided with mounting holes on a circle whose radius is greater than half the maximum radius of the foil, the webs of all foils being in mutual registry with their mounting holes aligned to form throughgoing bores for the passage of fasteners to secure alternate webs of each foil to said driving and said driven member, respectively.

3,985,001

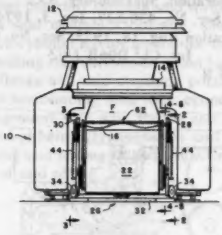
TAKE UP AND DOFFING APPARATUS FOR A CIRCULAR KNITTING MACHINE

Paul W. Eschenbach, Inman, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 450,602, March 13, 1974, abandoned. This application Jan. 10, 1975, Ser. No. 540,268
Int. Cl.³ D04B 15/88
U.S. Cl. 66—149 R **17 Claims**

1. A circular knitting machine comprising: means to produce a knitted fabric, means to take up the knittd fabric mounted on said machine, a pair of rolls in nip forming relationship located between said means to produce and said means to take up knitted fabric receiving fabric from said means to produce and delivering knitted fabric to said means to take up fabric, means to drive said pair of rolls and said means to take up fabric in synchronism and means to automatically adjust the speed of said pair of rolls and said means to take up fabric, said means to take up the knitted fabric including a surface drive roll, said surface drive being mounted with

its centerline offset from the centerline of the knitting machine, said means to adjust the speed includes a slidably



mounted rod member between said means to produce knitted fabric and said pair of rolls.

3,985,002

METHOD AND APPARATUS FOR MONITORING THE OPERATIVE POSITION DATA OF GROUP CONTROLLED KNITTING MACHINES

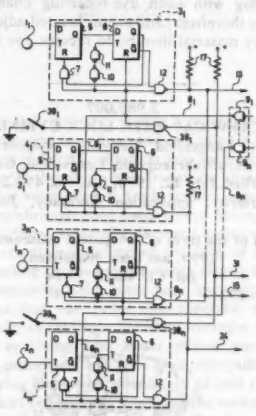
Ivo Kouklik, Trebic, and Josef Navratil, Namest nad Oslavou, both of Czechoslovakia, assignors to Elitex, Zavody textilniho strojirenstvi generalni reditelstvi, Liberec, Czechoslovakia

Filed Mar. 26, 1975, Ser. No. 562,018

Claims priority, application Czechoslovakia, Mar. 28, 1974, 2222-74

Int. Cl.² D04B *15/66, 15/78*

U.S. Cl. 66—154 A **12 Claims**



6. Apparatus for monitoring the operative position data of each of a plurality of independently operable circlar knitting machines and for transferring the data to the address input of a common memory control system to control the pattern operation of each machine comprising, means responsive to the operation of said knitting machine to provide a sequence of pulses indicative of the needle position and the course number with respect to a given point about the circumference of said machine, means for generating a continuous cycle of timing pulses each of which corresponds to a selected knitting machine for which data is to be monitored, a first and second sweep circuit for processing said needle and course position pulses and providing an output in response to a given timing pulse, first and second adding circuits connected to said first and second sweep circuits respectively for receiving said output thereof, a random access memory to which position data information is stored, the output of said random access memory being connected to each of said first and second adding circuits and being responsive to said timing signal to provide an output to each of said first and second adding circuits, said first and second adding circuits, responsive to said timing pulse providing an output signal combining the input from said first and second sweep circuit and from said random access memory said first and second adding circuits being simultaneously connected to both the input of said random access memory and to said common memory control system whereby in response to said timing signal said combined output can be fed thereto.

3,985,003

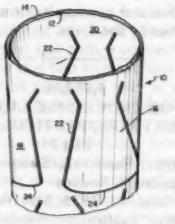
PRESEAMED AND PREFORMED KNITTED GARMENTS AND METHOD OF MAKING SAME

Alfred J. Reed, Greensboro, N.C., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Filed May 1, 1975, Ser. No. 573,550

Int. Cl.² D04B *7/04*

U.S. Cl. 66—196 **16 Claims**



1. A knitted structure comprising two concentric tubes simultaneously knitted concentrically with said tubes interconnected by knitting at specified regions to define a plurality of garment configurations between said concentric tubes, each of said garment configurations having a first surface on one of said tubes and a second surface on a juxtaposed portion of the other tube with said interconnected knitting forming the stitches connecting said concentric tubes into said garment configurations.

3,985,004

KNITTED BRIEFS

Martin Robert Johnson, Broughton Astley, and Arthur John Hood, Hinckley, both of England, assignors to Ridley, Spriggs and Johnson Limited, Hinckley, England

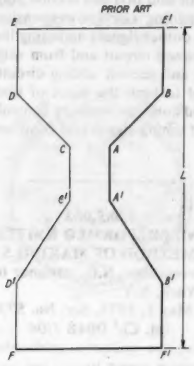
Filed Dec. 5, 1974, Ser. No. 529,912

Int. Cl.² A41B *9/02, 9/04*

U.S. Cl. 66—177 **7 Claims**

1. A method of producing a knitted brief blank of a flat form consisting of spaced front and back sections of an ultimate brief with inwardly and oppositely inclined edges defining respectively the fronts and backs of the leg openings in said brief, and an intervening substantially narrower crotch portion, said method comprising the steps of (a) first knitting a preliminary seamless tubular blank of a width half that of the ultimate brief required, said blank shaped walewise in a generally hour-glass configuration including two opposite end portions each of the maximum width of the tube and an interme-

diate substantially narrower portion of crotch fabric and (b) then slitting and the said preliminary seamless tubular blank



along a straight line and opening it out into a final brief blank of the aforementioned flat form.

3,985,005

APPARATUS FOR PROCESSING LIQUID-CONTAINING SUBSTANCE MIXTURES, PARTICULARLY CELLULOSE PULP

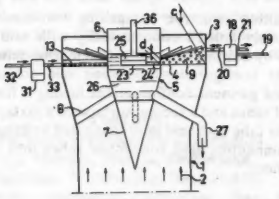
Nils Gustav Leffler, Sundsvall, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

Filed Mar. 11, 1975, Ser. No. 557,413

Claims priority, application Sweden, Mar. 14, 1974, 7403408

Int. Cl.[2] D21D 5/02

U.S. Cl. 68—181 R 25 Claims



1. An apparatus for treatment of cellulose pulp comprising a vertical treatment container adapted for axial flow of cellulose pulp therethrough, said container having a substantially circular cross-section, a filling body centrally located within said container, a plurality of screen bodies for the collection of liquid separated from the cellulose pulp, and means for mounting said screen bodies in the container, said screen bodies extending from the periphery of said container to said filling body and being arranged substantially radially throughout the cross-section of said container, each said screen body including two screen body walls of opposed spaced relationship with a least one of said screen body walls being pervious, each screen body wall being disposed in a separate, substantially vertically extending plane, each screen body including at least one cavity therein being defined by said screen body walls, said at least one cavity extending along the entire radial and vertical extents of said screen body.

3,985,006

DYEING AND PRINTING OF MATERIALS

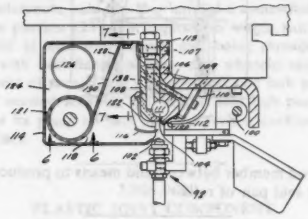
Norman E. Klein, Inman, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 430,527, Jan. 3, 1974, abandoned.

This application Aug. 18, 1975, Ser. No. 605,784

Int. Cl.[2] D06B 1/02

U.S. Cl. 68—205 R 8 Claims



1. An apparatus to apply dye to a moving material comprising a frame, means mounting a dye jet gun bar on said frame, means supplying liquid dye to said dye jet gun bar, said gun bar comprising a plurality of gun bar sections forming a plurality of separate dye-receiving chambers extending along the gun bar in end-to-end relation for receiving dye from said liquid dye-supplying means, each section being formed of a pair of mating portions each having a mating face with a dye-receiving cavity therein, and means operatively associated with said gun bar sections to maintain said sections and mating portions thereof in pre-determined position to each other with said cavities in said portions mating to form said chambers, said mating faces defining a plurality of dye-emitting orifices communicating with each dye-receiving chamber for discharge of dye therefrom, and means located adjacent said gun bar to convey material thereby to receive dye from said orifices.

3,985,007

SCREW CAP WITH LOCK CYLINDER

Theo Gerdes, Langenfeld, Germany, assignor to Blau KG Fabrik fur Kraftfahrzeugteile, Langenfeld, Germany

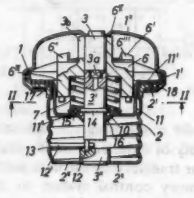
Filed July 22, 1974, Ser. No. 490,295

Claims priority, application Germany, July 24, 1973, 2337565

The portion of the term of this patent subsequent to Aug. 7, 1990, has been disclaimed.

Int. Cl.[2] B65D 55/14

U.S. Cl. 70—172 10 Claims



1. A closure cap for closing a container opening, comprising cap means having an upper part and a screw-threaded lower part adapted for threaded engagement with said container opening, said lower part having an engaging portion and being rotatably coaxially connected with said upper part; means in said cap means for connecting said lower part for turning with said upper part when the latter is turned in requisite direction for screwing said cap means into said container opening and for releasing said upper part for turning relative to said lower

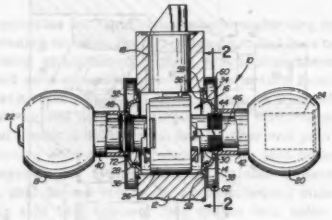
part when a predetermined turning moment during screwing said cap means into said opening is reached, said connecting and releasing means including a compression spring; locking means extending centrally through said spring for locking said cap means in said container opening, said locking means including a lock cylinder having an annular outwardly-projecting flange; a sealing ring surrounding said lock cylinder intermediate said flange and said engaging portion; and an abutment member surrounding said lock cylinder and being in abutting engagement with said flange and said spring, said abutment member being urged towards said engaging portion and compressing said sealing ring as a function of the inherent biasing force of said spring.

3,985,008

DOOR LOCK MOUNTING MEANS

LeRoy Hart, West Hartford, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Aug. 27, 1975, Ser. No. 608,284
Int. Cl.² E05B *15/00*
U.S. Cl. 70—224 **15 Claims**



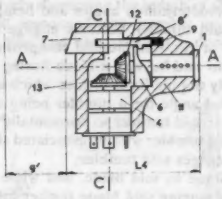
1. In a door lock assembly having a casing for mounting in a transverse opening in a door and including a tubular outer sleeve mounted in fixed position on said casing and projecting axially outwardly therefrom in a transverse direction relative to the door for supporting a knob spindle extending axially outwardly therethrough, said outer sleeve having a thread on its exterior surface, a radially disposed outer rose liner for engaging an associated portion of the face of the door and having an opening receiving said outer sleeve therethrough, means for restraining said outer rose liner against rotation relative to the door, an outer rose received on said outer sleeve outwardly of said rose liner and having a circular aperture therein receiving said outer sleeve coaxially therethrough, said outer rose having a generally radially disposed portion overlying an associated portion of said rose liner and a peripheral skirt generally surrounding the outer periphery of said outer rose liner for engaging the outer face of the door, and a tubular outer thimble threaded onto said outer sleeve, said thimble having a radially disposed axially inwardly facing shoulder engaging said outer rose for retaining said skirt in engagement with the face of the door, the improvement comprising said outer sleeve having an axially extending generally radially outwardly opening groove therein, said outer rose liner having an integral locking tab projecting generlly radially inwardly of said opening and disposed in said groove for restraining said outer sleeve against rotation relative to said outer rose liner, and said outer thimble having a generally cylindrical inner end portion extending axially inwardly from said shoulder through said aperture and into said opening, said inner end portion having an axially inwardly opening slot receiving said locking tab therein, said locking tab cooperating with said groove and said slot to restrain said outer thimble against rotation relative to said outer sleeve.

3,985,009

COMPACT ANTI-THEFT DEVICE FOR VEHICLES

Paul Lipschutz, Croissy-Sur-Seine, France, assignor to Societe d'Exploitation des Brevets Neiman S.A., Courbevoie, France

Filed Mar. 3, 1975, Ser. No. 554,802
Claims priority, application France, Mar. 18, 1974, 74.09087
Int. Cl.² B60R *25/02, 25/04*
U.S. Cl. 70—252 **8 Claims**



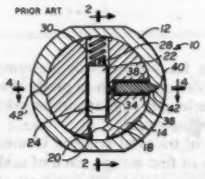
1. An anti-theft device for a vehicle comprising a structure including a bolt movable in a rectilinear path for locking engagement with an element of the vehicle necessary for the operation of that vehicle, an electrical switch means including a switch member rotatable about a first axis and a cylindrical lock including an operating element rotatable about a second axis different than said first axis, each of said first and second axes being different than said path, a connection between said rotatable element and said bolt to move said bolt in a locking and unlocking direction along said path as said lock is operated and a connection between said rotatable element and said rotary switch means to operate said switch means upon operation of said lock, said connection between said switch means and said lock including gears, said switch and said bolt overlapping each other along said second axis whereby the overall length of said structure, measured along said second axis is lesser than that of an existing structure in which said bolt and said switch are not so overlapped.

3,985,010

METHOD AND APPARATUS FOR DECODING TWISTING TUMBLER LOCK AND TWISTING TUMBLER LOCK RESISTANT THERETO

Robert A. Idoni, New Rochelle, N.Y., assignor to Lock Technology, Inc., New Rochelle, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,466
Int. Cl.² E05B *19/20, 27/04*
U.S. Cl. 70—364 A **3 Claims**



1. In a method of decoding a twisting tumbler lock of the type including a cylinder shell, a key plug rotatably mounted in said cylinder shell and having a longitudinally extending keyway therein, a plurality of transversely extending longitudinally spaced tumblers slidably and rotatably mounted in said key plug, each of said tumblers having a chisel shaped bottom disposed in said keyway and a radially extending aperture in the periphery thereof located at one of a predetermined number of different angles to the axis of said chisel shaped bottom and at one of a predetermined number of different distances

from said bottom, and a longitudinally extending transversely movable side bar having a plurality of protrusions, one for each tumbler, movable into said tumbler apertures, means for biasing said side bar into bridging relation with the shear plane of said lock, said side bar being permitted to move out of said bridging relation when all of said tumbler apertures are in horizontal and vertical register with said side bar protrusions, said apertures being horizontally registered with their associated protrusions when the chisel shaped bottom of said tumbler engages a key bit surface angulated at a preselected one of said predetermined angles and being vertically registered when said tumbler bottoms engage bits of predetermined depths of cut, said method comprising the steps of:

inserting into said keyway a blade having an upwardly and rearwardly sloping front surface which is angulated at the preselected angle for a tumbler being decoded to angularly orient said tumbler to horizontally register the aperture of said tumbler with its associated side bar protrusion until it engages said tumbler;

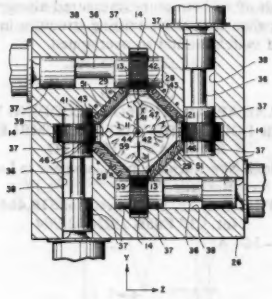
applying torque to said blade, and while maintaining said torque advancing said blade further into said keyway in engagement with said tumbler to twist said tumbler to register its radially extending aperture with its associated side bar protrusion to thereby cause engagement between said aperture and said protrusion whereby to result in resistance to further advancement of said blade; and

then determining the distance of said advancement.

3,985,011
CONTINUOUS EXTRUSION

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Sept. 12, 1975, Ser. No. 612,875
Int. Cl.² B21C *23/32, 33/00*
U.S. Cl. 72—60 **39 Claims**



1. Apparatus for continuously deforming an elongated workpiece of indefinite length to produce an elongated product of indefinite length, said apparatus comprising:

a. a deforming agency;

b. a plurality of trains of gripping element members;

c. A plurality of first means, each of said first means being operatively associated with one train of gripping element members, for providing an endless path for said train of gripping element members;

d. a plurality of second means, each of said second means engaging an adjacent pair of trains, for moving in unison each of said adjacent pair of trains of gripping element members around its respective endless path past a first station upstream of said deforming agency toward a second station downstream of said deforming agency, the first and second stations and the span therebetween being common to all of said plurality of endless paths;

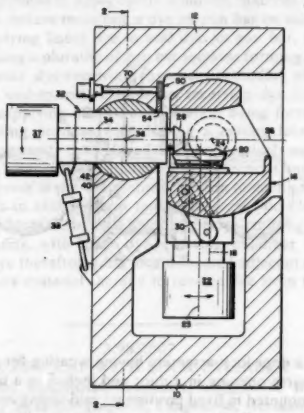
e. the gripping element members in each of said plurality of moving trains of gripping element members being configured to cooperate with each other to form a centrally apertured chamber extending between and moving from said first station to second station;

f. the moving chamber receiving the elongated workpiece in the central aperture thereof and being configured to continuously operatively engage the surface of the elongated workpiece for continuously applying motive force along the surface of the elongated workpiece in the direction of the deforming agency, whereby to continuously advance said elongated workpiece against said deforming agency and produce elongated product.

3,985,012
APPARATUS FOR FINISH ROLLING BEVEL PINIONS AND GEARS

Thomas A. Deprez, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed July 28, 1975, Ser. No. 599,580
Int. Cl.² B21H *5/04*
U.S. Cl. 72—101 **9 Claims**



1. In apparatus for roll forming tooth profiles on a workpiece by bringing a die and a workpiece into rolling engagement with each other with sufficient force to displace material on said workpiece, said apparatus being of a type which includes a first spindle means for carrying a gear member and a second spindle means for carrying a pinion member for meshing with said gear member, with one of said gear member and said pinion member being a die for forming tooth profiles on a workpiece and the other of said gear member and said pinion member being the workpiece, the improvement comprising:

a machine frame,

first mounting means for mounting said first spindle means within said machine frame so that said first spindle means can be moved about a pivot axis which intersects the axis of rotation of said second spindle means to thereby provide for a pivotal feed motion of the gear member relative to the pinion member,

second mounting means for mounting said second spindle means in said machine frame for limited pivotal movement about an axis which is parallel to the pivot axis of said first spindle means,

adjusting means operatively associated with said second spindle means for adjusting and fixing the angular relationship of said spindle means to thereby provide for a root angle adjustment of the tooth profiles being roll formed on a workpiece.

3,985,013

APPARATUS FOR RAPIDLY CHANGING STRAIGHTENING ROLLERS OF A ROLLER STRAIGHTENING MACHINE

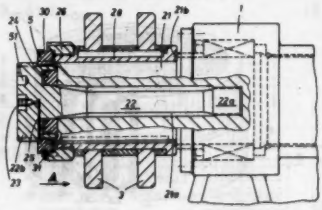
Horst Pillon, Bous, Saar, and Günther Morath, St. Ingbert, Saar, both of Germany, assignors to Moeller & Neumann GmbH, St. Ingbert, Saar, Germany

Filed Aug. 11, 1975, Ser. No. 603,305

Claims priority, application Germany, Aug. 16, 1974, 2439329

Int. Cl.² B21B *31/08*

U.S. Cl. 72—238 **5 Claims**



1. Apparatus for rapidly changing straightening rollers of a straightening machine for straightening rolled bars or profiles, comprising straightening rollers, each straightening roller mounted on a mounting sleeve means in turn mounted on a roller axis, said roller axis being hollow, a hydraulically extendable tie-rod means having one end screw-threaded and screwed into said hollow axis, and another end provided with a tensioning head means projecting from said hollow axis, a first bayonet ring means mounted on said tensioning head means, said tie-rod means, in a non-extended state thereof, pressing said first bayonet ring means into roller securing engagement with said mounting sleeve means, and in an extended state permitting rotation of said first bayonet ring means into a first position in which said first bayonet means is axially slidable together with said mounting sleeve means and said roller mounted thereon, a coupling means secured on said mounting sleeve means and engaging into said first bayonet ring means, said coupling means permitting rotary and limited axial displacement of said first bayonet ring means relative to said mounting sleeve means, and into a second position in which said first bayonet ring means is locked to said tensioning head means, a support device mounted for linear and pivotal displacement into line with said hollow axis, a transfer shaft means rotatably mounted in said support device, a withdrawal bayonet ring means displaceable on said transfer shaft means and lockably engageable with said first bayonet ring means to withdraw said first bayonet ring means and said mounting sleeve means coupled thereto by said coupling means and supporting said straightening roller from said hollow axis over said tensioning head means and onto said transfer shaft means, said tensioning head means having an outer periphery provided with longitudinal grooves and with ledges for receiving said first bayonet ring means.

3,985,014

PORTABLE APPARATUS FOR USE ON A WRECKED VEHICLE BY A RESCUE SQUAD

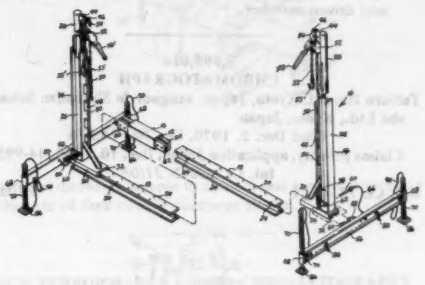
Cecil J. Smith, 308 Forest Ave., Albemarle, N.C. 28001

Filed Oct. 12, 1973, Ser. No. 405,879

Int. Cl.² B21D *1/12*

U.S. Cl. 72—457 **2 Claims**

1. Portable apparatus for use by an emergency rescue squad in spreading and shifting a wrecked vehicle at the site of an accident to remove injured persons therefrom, such apparatus including a portable U-shaped support consisting solely of a rigid base member having a longitudinal extent which at least exceeds the width of such vehicle and a pair of arm members attached to said base member at spaced locations therealong and extending from said base member in perpendicular relation thereto, the configuration, dimensions and structural arrangement of said portable U-shaped support permitting it to be selectively operable and positionable over, under, across, alongside, in front of or in back of said wrecked vehicle, an attachment line means associated with each of said arm members, respectively, and including means for securing one end of said attachment line means to said vehicle, and actuator means associated with at least one of said attachment line means for selectively shortening the length of said attachment line between said associated arm member and said vehicle, characterized in that said base member is divided into three



elements formed with means at the respective ends thereof permitting selective assembly of said base elements rigidly together in lengthwise relation to form said base member and permitting selective disassembly of said base elements for readily transporting the same, and further characterized in that said three base elements comprise a center element and two end elements, said end elements being in the form of H-beams and said center element including slots at each of its respective ends to receive the webs of said end element H-beams, and said center element including holding means for selectively engaging the webs of said end element H-beams to maintain said center element and said end elements in engagement.

3,985,015

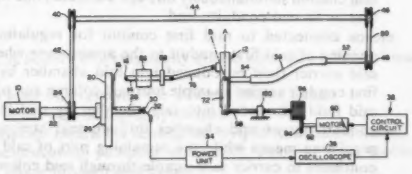
IMPACT WEAR TESTING DEVICE

Stephen L. Rice, 9 Storrs Heights Road, Storrs, Conn. 06268

Filed Nov. 20, 1975, Ser. No. 633,851

Int. Cl.² G01N *3/34*

U.S. Cl. 73—12 **21 Claims**



1. In an impact wear testing device, the combination comprising

a. drive means;

b. a base;

c. a driven member mounted on said base for reciprocating movement along a first axis and operatively connected to said drive means for controlled oscillations along said first axis;

d. a support member rotatably mounted on said base for rotation and having an impact portion aligned with said

first axis, said support member being operatively connected to said drive means for rotation thereof, said driven member being oscillatable to bring one end adjacent said support member impact portion;

e. a pair of impact wear testing elements comprising specimen mounting means and force measuring means, one of said testing elements being disposed upon said one end of said driven member and the other of said testing elements being disposed upon said support member impact portion whereby a specimen mounted on said specimen mounting means impacts periodically with said force measuring means during oscillation of said driven member; and

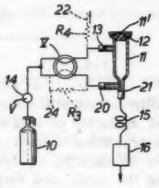
f. control means responsive to said force measuring means operable upon said drive means to vary the oscillations of said driven member.

3,985,016

CHROMATOGRAPH

Tatsuro Haruki, Kyoto, Japan, assignor to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed Dec. 2, 1970, Ser. No. 94,576
Claims priority, application Japan, Dec. 10, 1969, 44-99598
Int. Cl.² G01N *31/08*
U.S. Cl. 73—23.1 **5 Claims**



1. A chromatograph comprising:

a sample introducing chamber having a sample inlet port at its upstream side;

a column having one end connected to the downstream side of said chamber;

a first conduit connected at one end to said chamber adjacent to said inlet port at a first port;

a second conduit connected at one end to said chamber between said column and said first port at a second port;

said first and second ports being continuously in communication with said column;

means for providing carrier fluid;

valve means connected between said fluid providing means and said first and second conduits for directing carrier fluid from said fluid providing means to said chamber and said column simultaneously through a selected one of said first or second conduits; and

means connected to said first conduit for regulating an opening of said first conduit to the atmosphere whereby said carrier fluid introduced into said chamber by said first conduit carries a sample into said column and part of said fluid introduced into said chamber by said second conduit purges said chamber through said atmosphere regulating means while the remaining part of said fluid continues to carrier said sample through said column.

3,985,017

GASEOUS CONTAMINATE DOSIMETER AND METHOD

Robert L. Goldsmith, Belmont, Mass., assignor to Abcor, Inc., Cambridge, Mass.

Filed Jan. 2, 1975, Ser. No. 537,908
Int. Cl.² G01N *31/00*
U.S. Cl. 73—23 **17 Claims**

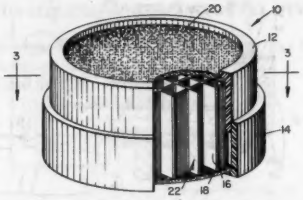
1. A passive gaseous contaminate dosimeter to determine the amount of gaseous contaminates in a gas stream, which dosimeter comprises in combination:

a. a closed container;

b. a gaseous contaminate collecting medium of a solid or liquid sorbent within the interior of the container, which medium sorbs or reacts with the gaseous contaminate, the amount of which is to be determined;

c. an inert porous sheet barrier element forming a portion of at least one side of the container, which barrier element permits the diffusion freely of the gas stream containing the gaseous contaminate from the ambient atmosphere into the interior of the container;

d. a dead air space between and separating the barrier element and the collecting medium;



e. the barrier element characterized by having a low diffusional resistance to the gas stream with the gaseous contaminate relative to that of the dead air space to permit the collection on the collecting medium of gaseous contaminates which diffuse into the interior of the container in proportion to the average ambient concentration about the dosimeter, and substantially independent of the ambient convection patterns of the gas stream exterior to and about the dosimeter; and

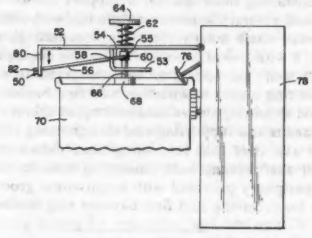
f. a plurality of passageways extending within the dead air space to provide mechanical support to the sheet barrier element.

3,985,018

CONTAINER SEAL PROVER

Kenneth W. Fox, Bellingham, Wash., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Aug. 28, 1975, Ser. No. 608,777
Int. Cl.² G01M *3/36*
U.S. Cl. 73—52 **9 Claims**



1. Apparatus for detecting a change in the bulging or contracting of the wall of a sealed container when the container is unsealed comprising base means mountable next adjacent the wall of a container, (The apparatus of claim 1 comprising), fulcrum means extending from said base, lever means comprising a first lever arm means and a second lever arm means joined to each other at said fulcrum and pivotally secured to said fulcrum, container wall contacting means responsive to bulging and contracting of the walls of a sealed container when said container is unsealed, said container wall contacting means operably connected to said first lever arm for amplifying said bulging or contracting or said container

wall through said second lever arm, indicator means affixed to said base for indicating the movement of said second arm responsive to said bulging and contracting.

3,985,019

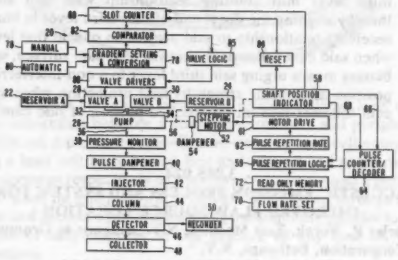
LIQUID CHROMATOGRAPHY SYSTEM WITH SOLVENT PROPORTIONING

Detlef R. Boehme, 2971 Cherry Lane, Walnut Creek, Calif. 94596; Kenneth C. Judah, 1598 Meek Ave., Napa, Calif. 94558, and Miner N. Munk, 28 Oak Knoll Loop, Walnut Creek, Calif. 94596

Filed Nov. 10, 1975, Ser. No. 630,101

Int. Cl.² G01N *31/08*

U.S. Cl. 73—61.1 C **10 Claims**



1. A liquid chromatography system, comprising in combination:

a liquid chromatography column;

first and second reservoirs for first and second solvents to be utilized as the mobile phase in said system;

pumping means including a pumping chamber and a piston mounted for axial reciprocation in said chamber for flowing said solvents through said column;

stepping motor means for driving said piston for reciprocation in said chamber through successive pumping cycles including pump and fill stroke subcycles;

first and second solonoid-actuated proportioning valves positioned respectively in the flow paths between said first and second reservoirs and said pump, said first and second valves operating in complementary fashion with respect to opening and closing thereof;

gradient setting means for setting a preselected proportion between said first and second solvents;

means responsive to said gradient setting means for opening at least one of said valves during a predetermined portion of the said fill stroke sub-cycle and for closing said valve over the remainder of said fill cycle, the said complementary operation of said other valve thereby dividing the said fill sub-cycle in accordance with said gradient setting.

3,985,020

OIL POLLUTION COMPLIANCE MONITOR

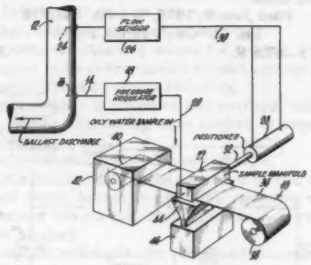
James O. Moreau, Denville, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed July 14, 1975, Ser. No. 595,881

Int. Cl.² G01N *15/00, 33/18*

U.S. Cl. 73—61.1 R **22 Claims**

1. A pollution compliance monitor system for monitoring and recording pollutant discharged over a specified period in a flowing discharge stream comprising, in combination: a belt of tape movable at a constant speed from a supply reel to a takeup reel; sample manifold means situated above said tape for receiving and directing a sample of the discharge stream at a constant velocity through said tape as a function of the flow rate of said discharge stream; flow sensor means for sensing the flow rate of said discharge stream; positioner means responsive to the sensed flow rate for controlling the



amount of discharge sample to contact said tape in proportion to the rate of flow of said discharge stream.

3,985,021

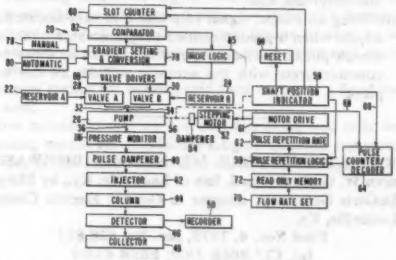
HIGH PERFORMANCE LIQUID CHROMATOGRAPHY SYSTEM

Pierre Y. Achener; Detlef R. Boehme, both of Walnut Creek, and Kenneth C. Judah, Napa, all of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Nov. 10, 1975, Ser. No. 630,103

Int. Cl.² G01N *31/08*

U.S. Cl. 73—61.1 C **16 Claims**



1. A liquid chromatography system comprising in combination:

at least one reservoir for a liquid mobile phase;

a liquid chromatography column;

detector means for sensing the output from said column;

reciprocating pumping means for pumping said mobile phase through said column;

motor means coupled to said pumping means for driving said pumping means through successive cycles of reciprocation;

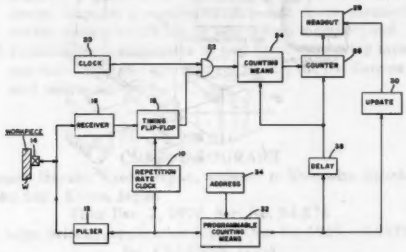
means for controlling the rotational speed of said motor means throughout the corresponding reciprocation cycle of said pumping means, to provide preselected average rotational speeds over predetermined subintervals of each successive reciprocation cycle; and

means for synchronizing said control means with said pumping means to provide said speed control over each said successive reciprocation cycle.

3,985,022
ULTRASONIC THICKNESS MEASURING METHOD AND APPARATUS

Christopher C. Dileo, Brewster, N.Y., Richard J. Pittaro, Stamford, Conn., assignor to Krautkramer-Branson, Incorporated, Stamford, Conn.

Filed June 9, 1975, Ser. No. 584,778
Int. Cl.² G01N *29/00, 29/04*
U.S. Cl. 73—67.8 R **32 Claims**



1. The method of measuring the dimension of a workpiece by the ultrasonic pulse-echo method comprising:

transmitting periodically an ultrasonic search pulse into the surface of the workpiece and receiving an echo pulse responsive to each such search pulse intercepting an acoustic impedance change;

providing counts commensurate with the transit time of a respective search pulse traversing the workpiece dimension from said surface to the impedance change as determined by the time interval between a first signal responsive to the transmission of such search pulse and the receipt of a second signal responsive to the echo pulse associated with the respective search pulse;

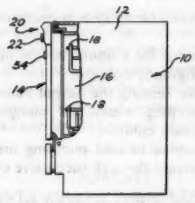
accumulating the counts provided during successive such time intervals, and

providing an output signal responsive to said accumulated counts when a predetermined programmable quantity of search pulses has been transmitted, said quantity being commensurate with the acoustic velocity of the workpiece.

3,985,023
DOOR LATCH CONTROL MEANS FOR A DISHWASHER

Lauren W. Guth, deceased, late of Louisville, Ky., by Margaret DeGaris Guth, heir, assignor to General Electric Company, Louisville, Ky.

Filed Nov. 4, 1975, Ser. No. 628,813
Int. Cl.² B08B *3/00*; E05B *43/00*
U.S. Cl. 70—267 **3 Claims**



1. A door latch control means for automatically opening the door of a dishwasher during the drying cycle, comprising:

a timer having a notched cam surface;

a first lever having first and second ends and a cam follower disposed intermediate said ends, said first lever being pivotably supported by said door at its first end;

a spring-biasing means supported by said door and preselectively attached to said first lever to urge said cam follower into contact with said cam surface;

a post projecting from said first lever and located remote from said first end thereof;

a stop preselectively positioned on said door near said first lever;

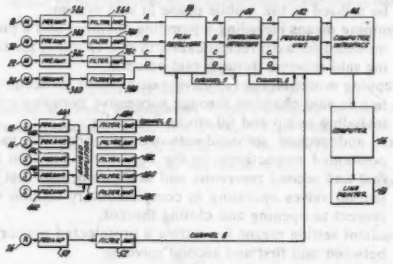
a second lever having a first end and a second bifurcated end, said second end being located in operating position with respect to a latch release attached to said door, said second lever further being supported on said dishwasher door by a pivotal mounting means intermediate said ends; and

a third lever means attached to and supported by said second lever, said third lever means including a biasing means attached adjacent one end thereof to urge said third lever into abutting relationship with said stop, thereby aligning the distal end of said third lever in blow-receiving relationship to said projection of said first lever when said cam follower is abutting said cam surface, said biasing means urging said third lever to a non-interferring position after being struck by said projection when said cam follower falls into a notched portion of said cam.

3,985,024
ACOUSTIC EMISSION PROCESS AND SYSTEM FOR IMPROVED FLAW SOURCE LOCATION

Charles R. Horak, East Meadow, N.Y., assignor to Grumman Corporation, Bethpage, N.Y.

Filed Feb. 28, 1975, Ser. No. 554,195
Int. Cl.² G01H *1/00*
U.S. Cl. 73—71.4 **24 Claims**



1. A process for determining acoustic emission flaw source location in workpieces, comprising the steps of:

a. arranging at least two transducers in a spaced array to receive acoustic flaw source signals;

b. spatially filtering any signals received by the transducers to reject those signals which are beyond a predetermined signal source proximity to the transducers as determined by predetermined time relationships between the signals received by the transducers by:

i. detecting the rise times of the received signals;

ii. rejecting those signals received by the transducers which have a rise time greater than a predetermined value;

iii. detecting the time coincidence of the signals received by the transducers;

iv. rejecting those signals which are outside of a preselected time coincidence; and

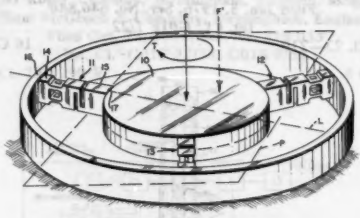
c. electronically computing the coordinates of the sources of the acoustic emission signals from the non-rejected signals to provide an accurate determination of acoustic emission flaw source locations.

3,985,025

SHEAR MEASURING FLEXURE ISOLATED LOAD CELLS

Alfred Newman Ormond, 11969 E. Rivera Road, Santa Fe Springs, Calif. 90670

Filed Jan. 20, 1975, Ser. No. 542,369
Int. Cl.[2] G01L *1/26*
U.S. Cl. 73—141 A 2 Claims



1. At least two shear measuring flexure isolated load cells for connection between a stationary structure and peripheral points on a platform, each flexure isolated load cell comprising a load cell body having first and second end portions for securement respectively to a stationary structure and a peripheral point on said platform, a straight line passing through said first and second end portions being substantially parallel to the plane of said platform in the absence of any load on said platform,

a. one of said end portions including a central cut-out to define spaced parallel body portions on opposite sides of said straight line passing between said end portions, and strain gauges fixed to opposite sides of said body portions responsive to a force on said platform having a component normal to the plane of said platform; and,

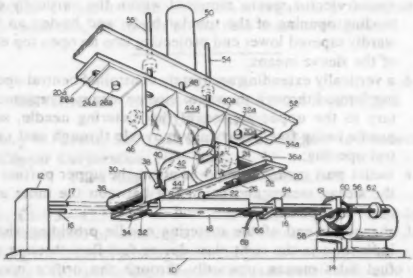
b. the other of said end portions including integrally formed flexure means, said flexure means comprising oppositely directed slots in said other end portion of said body defining therebetween a flexure web lying in a plane perpendicular to said straight line and to the plane of said platform, whereby moments created by off-center loading of said platform are isolated from the strain gauge means on each load cell by the integrally formed flexure means in each load cell.

3,985,026

SURFACE COATING TEST APPARATUS

Lawrence C. Griffin, Toledo; Homer D. F. Peters, Sylvania, and Douglas E. Smith, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 4, 1975, Ser. No. 565,206
Int. Cl.[2] G01N *3/56, 3/04*
U.S. Cl. 73—150 R 6 Claims



1. Apparatus for testing a coating applied to glass containers for resistance to scratching when two glass containers are moved relative to one another which comprises, in combination:

a base;

a pair of longitudinally spaced-apart support columns mounted on said base;

a pair of transversely spaced-apart rails extending between and held by said support columns;

a carriage, slideably mounted on said rails;

a first container chucking means for holding a first glass container to be tested carried by said carriage, said first container chucking means including;

a. a support plate attached to said carriage, said support plate having longitudinal slots formed in opposed ends thereof;

b. a clamp bracket held in one of said slots;

c. a motor bracket held in the other one of said slots;

d. a fluid motor, having an extensible operating rod which is directed toward said clamp bracket, secured to said motor bracket;

e. a clamp pad attached to the end of said extensible operating rod; and

f. a cradle, generally shaped to conform to the body contours of a glass container to be tested, positioned on said support plate between said clamp bracket and said motor bracket;

a second container chucking means for holding a second glass container to be tested positioned above said first container chucking means, said second container chucking means including;

a. a support plate having longitudinal slots formed in opposed ends thereof;

b. a clamp bracket held in one of said slots;

c. a motor bracket held in the other one of said slots;

d. a fluid motor, having an extensible operating rod which is directed toward said clamp bracket, secured to said motor bracket; and

e. a clamp pad attached to the end of said extensible operating rod;

a fluid motor, positioned above said second container chucking means, having an extensible operating rod that is attached to said support plate, for applying a downward force on said second chucking means normal to said second chucking means and for supporting said second chucking means;

support means for holding said fluid motor at a fixed location;

drive means for moving said carriage along said rails; and

sensing means for generating a signal quantity representative of the force required to move said carriage.

3,985,027

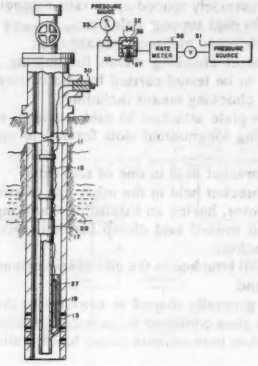
CONTROLLED FLOW IMPEDANCE IN A PRESSURE SENSING SYSTEM

Alfred J. Tricon, Houston, Tex., assignor to Sperry-Sun, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 499,703, Aug. 22, 1974, abandoned. This application July 10, 1975, Ser. No. 594,912
Int. Cl.[2] E21B *47/06*
U.S. Cl. 73—151 8 Claims

1. In a borehole measuring system for detecting pressure variations in a borehole and transmitting detected pressure variations to the surface, microtubing extending from the surface to a point in the borehole at which pressure variations are to be detected, means at the surface for supplying a fluid to the microtubing, means at the surface for providing indica-

tions of fluid pressure in the microtubing, and micro flow means for isolating the pressure indication providing means



from the supplying means, said micro flow means having a flow coefficient equal to or less than 0.04.

3,985,028

SAMPLE COLLECTING APPARATUS

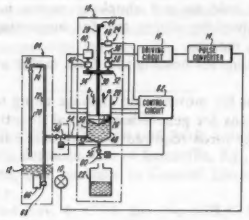
Takeshi Yoshida, Musashino, Japan, assignor to Kabushiki Kaisha Hokushin Denki Seisakusho, Tokyo, Japan

Filed Mar. 31, 1975, Ser. No. 563,369

Claims priority, application Japan, Mar. 29, 1974, 49-36211; Oct. 9, 1974, 49-122759[U]

Int. Cl.² G01N *1/14*

U.S. Cl. 73—198 **11 Claims**



1. An apparatus for successively collecting small-volume samples from a fluid stream in response to the flow rate thereof, which includes: sample storing means, means for receiving a fluid sample from said stream and for subsequently discharging the received sample into said sample storing means, means for measuring the flow rate of said stream to provide an output signal representative thereof, means responsive to said output signal for causing said sample receiving means to receive a fluid sample of the volume related to said signal, said output signal being in the form of a pulse signal the pulse rate of which varies depending on the flow rate of said stream, said means responsive to said output signal including a pulse motor to which said pulse signal is applied during a predetermined period of time, and a mechanism drivingly connected to said pulse motor for driving said sample receiving means at a rate corresponding to said output signal to cause said sample receiving means to receive therein a sample of the corresponding volume, said sample receiving means including a piston cylinder with a piston member and a cylinder member, said members being adapted to define a sample receiving chamber, said piston being connected to said mechanism so that the former is driven by the latter during said predetermined period of time by a distance corresponding to the rate of said pulse motor.

3,985,029

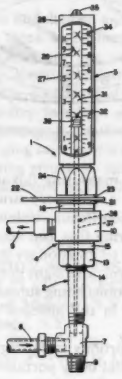
VARIABLE RESTRICTION FUEL FLOW METER

Walter F. Green, 4431 Logan Ave. NW., Canton, Ohio 44709

Filed Jan. 5, 1976, Ser. No. 646,840

Int. Cl.² G01F *1/22*

U.S. Cl. 73—210 **16 Claims**



1. Improved fuel flow meter construction of the type having a vertically extending tubular body with a vertically extending opening formed therethrough, fuel inlet and outlet means provided on the body, a closed sight glass mounted on the upper end of the tubular body, metering orifice means provided within the vertically extending opening, a metering needle movably mounted within the vertically extending opening and extending through the metering orifice means and having an upper end extending into the sight glass, and the sight glass having position indicating means; the improvement including:

a. hollow sleeve means telescopically mounted within the vertically extending opening and forming upwardly extending inner fuel passage means within the sleeve means, said upwardly extending fuel passage means communicating with the fuel inlet means;

b. relief means provided on the exterior of the sleeve means and forming downwardly extending outer fuel passage means about the exterior of the sleeve means within a portion of the tubular body opening means, said downwardly extending fuel passage means communicating with the fuel outlet means;

c. vapor ejector means mounted within the vertically extending opening of the tubular body, and having an inwardly tapered lower end projecting into an open top end of the sleeve means;

d. a vertically extending accurately controlled central opening formed through the vapor ejector means complementary to the upper portion of the metering needle, said needle being freely vertically movable through said central opening;

e. outlet port means formed adjacent the upper portion of the sleeve means and extending between the inner and outer fuel passage means; and

f. the upper end of the metering needle providing visual indication in the sight glass during fuel flow through the fuel inlet means, upwardly through the orifice means around the metering needle, upwardly through the sleeve means inner fuel passage means, through the outlet port means and downwardly through the outer fuel passage

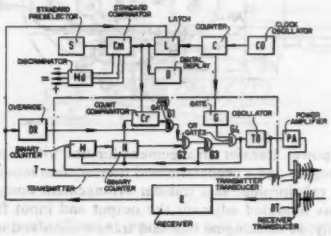
means, and through the fuel outlet means of the tubular body indicating the rate of fuel flow through said orifice means.

3,985,030

ULTRASONIC ACOUSTIC PULSE ECHO RANGING SYSTEM

Michael Roger Charlton, Birmingham, England, assignor to William McGeoch & Company, Birmingham, England

Filed Oct. 29, 1974, Ser. No. 519,033
Int. Cl.² G01F *23/28*; G01S *9/68*
U.S. Cl. 73—290 V **8 Claims**



4. An ultrasonic acoustic pulse echo ranging system for monitoring the depth of liquid above a datum level in a tank, the system comprising a transmitter transducer and a receiver transducer for mounting side-by-side, upwardly directed and exposed to the liquid in the tank at the datum level, and, for coupling to the transducers from outside the tank, a transmitter including an ultrasonic frequency oscillator to energise the transmitter transducer to transmit acoustic pulses of the ultrasonic frequency, a gate to start the oscillator, a continuously cycling counter coupled with and effective to actuate the gate to start the oscillator at the start of each counting cycle, a regulator to stop the oscillator to determine the length of each transmitted acoustic pulse in terms of the number of cycles of the ultrasonic frequency in the pulse, a receiver to detect outputs from the receiver transducer and to generate output pulses in response to echoes of the acoustic pulses from the free surface of the liquid, a display device, and latching means responsive to a receiver output pulse to connect the counter to the display device to display a measure of the time interval between the transmission of an acoustic pulse and the detection of its echo, the regulator including a regulating counter of the ultrasonic cycles which is resettable at zero by the stopping of the oscillator, and the regulator including a count comparator, which is coupled to the latching means, to determine that the regulator is responsive to variations between successive measured time intervals to regulate, in the sense of the variations, the length of the next transmitted pulse.

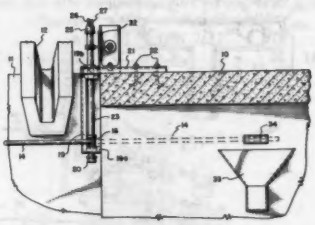
3,985,031

METHOD OF AND APPARATUS FOR SAMPLING MOLTEN SLAG

Henry W. Franz, Salt Lake City, Utah, assignor to Kennecott Copper Corporation, New York, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,647
Int. Cl.² G01N *1/20*
U.S. Cl. 73—423 R **7 Claims**

1. A method of sampling a stream of molten material, comprising the steps of passing a sampling arm through the stream; passing a coolant through the arm so as to continually cool the arm as it passes through the stream, whereby such arm will pick up a coating of molten material and solidify it as a sample; holding the sample arm over a sample collecting area for a time sufficient for the sample to cool, contract, break apart and fall away from the arm; and recovering the sample by



collecting pieces of the solidified coating as it contracts, breaks apart, and falls away from the arm.

3,985,032

MICROPIPETTE FILTER TIPS

Souren Avakian, Westport, Conn., assignor to Centaur Chemical Co., Stamford, Conn.

Filed Nov. 13, 1975, Ser. No. 631,847
Int. Cl.² B01L *3/02*
U.S. Cl. 73—425.4 P **10 Claims**

1. Filter apparatus for use with a liquid sampling pipette comprising: a detachable and disposable tip member in the form of a truncated hollow cone defining an axial passage therethrough; an opening defined by the truncated tip of said cone and communicating with said passage to receive the entrance and discharge cycle of liquid sample therethrough; and a porous filter positioned at said tip to close said opening during half of said entrance and discharge cycle and displaceable therefrom for the other half of said cycle.

3,985,033

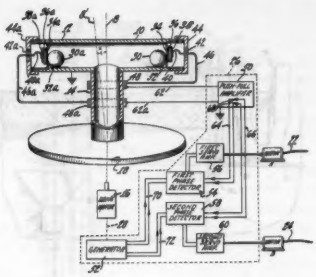
APPARATUS FOR ERECTING A TRUE VERTICAL AXIS

John Randolph Ford, Narberth, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 15, 1952, Ser. No. 288,081
Int. Cl.² G01C *9/06*; G01P *15/00*
U.S. Cl. 73—505 **13 Claims**

1. Apparatus for deriving an electrical signal comprising, means for initially positioning a body along an axis including means for supporting said body so that said body is free to tilt and thereby depart from a position along said axis, means for rotating said body about said axis at a constant rotational velocity, thereby causing the body to exert a centrifugal force in a rotating radial line normal to said axis, and means responsive to variations in the force of said body along the said radial

line of centrifugal force resulting from departure of said body from said position on said axis to provide an electrical signal



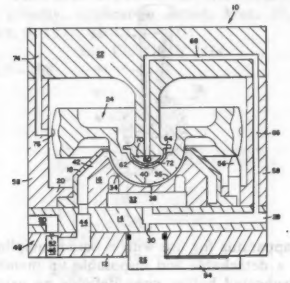
with a periodicity equal to that of said rotation and variable in accordance with said force variations.

3,985,034

HIGH "G" GYRO WITH FLUIDIC EXHAUST CONTROL FOR FLUIDIC BEARING

Rayburn K. Widner, Arab, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 28, 1975, Ser. No. 554,261
Int. Cl.² G01C *19/12, 19/16, 19/26*
U.S. Cl. 74—5.7 **4 Claims**



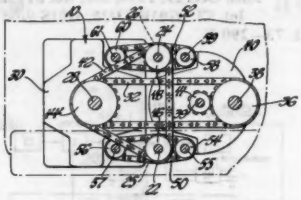
1. A gyro comprising a stator housing, a rotor rotatably mounted in said stator housing by fluidic bearing means, said fluidic bearing means having a plurality of circumferentially arranged ports that have means for admitting fluid to said plurality of circumferentially arranged ports and said plurality of circumferentially arranged ports opening into a fluidic space defined between said rotor said rotor stator housing, exhaust means consisting of a circumferentially arranged exhaust from said fluidic bearing space and being located radially outwardly from said ports, and means for providing a reduced pressure at said circumferentially arranged exhaust to cause the fluid from the fluidic bearing space to be attracted to said exhaust and prevent the fluid from the bearing space from exerting undesirable forces on said rotor, said means for providing said reduced pressure at said circumferentially arranged exhaust consisting of a jet arrangement in said stator housing in which an outlet passage from said circumferential exhaust communicates at a 90° angle with a jet outlet that receives fluid through a restricted orifice from an inlet passage to cause the fluid being jetted through said orifice and into said jet outlet to cause a low pressure to be produced in said outlet passage and said circumferential exhaust.

3,985,035

POWER TRANSFER UNIT

Donald L. Manning, Orchard Lake, and Milton H. Schelter, Northville, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 260,396, June 7, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,767
Int. Cl.² F16H *37/06*
U.S. Cl. 74—15.63 **3 Claims**



1. A power transfer arrangement for use with a predetermined engine and a predetermined transmission mounted in a parallel relationship, said transfer arrangement comprising a drive box mounted adjacent the output and input faces, respectively, of said engine and said transmission and including a contoured outer wall and a contoured inner wall, said inner contoured wall being secured to said engine output face and to said transmission input face; a drive shaft extending from said output face of said engine through an opening formed in said contoured inner wall and rotatably mounted on the inner surface of said contoured outer wall of said drive box; input means for said transmission including a countershaft having the ends thereof rotatably mounted on the respective inner surfaces of said contoured outer and inner walls of said drive box a predetermined distance from said drive shaft; a mainshaft extending from said transmission and rotatably mounted through an opening formed in said contoured inner wall into said drive box adjacent and parallel to said countershaft; a plurality of vehicular accessories mounted at predetermined locations on said contoured outer and inner walls of said drive box and each having a shaft extending therefrom and rotatably mounted at predetermined locations on the inner surface of the oppositely disposed wall of said drive box apart from the area adjacent said engine; first and second sprockets mounted respectively on said drive shaft and said countershaft, and a third sprocket mounted on said countershaft; additional sprockets mounted on said shafts of at least two of said plurality of vehicular accessories; first and second operatively interconnected driving means mounted respectively on said countershaft and said mainshaft; a first drive chain mounted around said first sprocket on said drive shaft and said second sprocket on said countershaft; and a second drive chain mounted around said third sprocket on said countershaft and said sprockets of said at least two of said accessories, said first drive chain serving to drive said countershaft, said operatively interconnected driving means serving to drive said mainshaft and hence said transmission, and said second drive chain serving to drive said accessories.

3,985,036

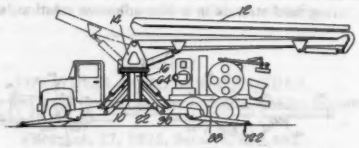
OUTRIGGER AND MOUNTING MEANS FOR TRUCK WITH A CONVEYOR BOOM

Raymond E. Decker, Riverside, and Evan Prichard, Newport Beach, both of Calif., assignors to Challenge-Cook Bros., Incorporated, Los Angeles, Calif.

Filed Feb. 15, 1973, Ser. No. 332,602
Int. Cl.² F16H *21/44*
U.S. Cl. 74—96 **3 Claims**

1. A support outrigger for a truck mounted boom comprising

a support assembly capable of being fixed to the truck;
a first leg member pivotally mounted to said support assembly about a horizontal axis;
a second leg member pivotally mounted to said first leg member about a horizontal axis;
actuating means for pivoting said first leg member relative to said support assembly;
means for constraining said second leg member to pivot about said first leg member in an opposite direction and at a greater rate than said first leg member when said first leg member pivots about said support assembly, said constraining means including a flexible, tension support-



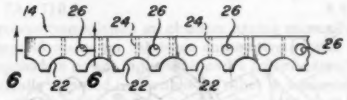
ing member fixed at one end to said support assembly and at another end to said second leg member, a first circular member concentrically positioned about the axis of rotation of said first leg member relative to said support assembly and a second circular member positioned concentrically about the axis of rotation of said second leg member relative to said first leg member, said flexible member being extended from said support assembly to said second leg member over said first circular member and said second circular member; and
means for preventing said second leg member from pivoting relative to said first leg member through more than a predetermined angle.

3,985,037

BEAD CHAIN SPROCKET CONSTRUCTION

Leonard F. Peyser, Old Sleepy Hollow Road, Briarcliff Manor, N.Y. 10510

Filed May 12, 1975, Ser. No. 576,302
Int. Cl.² F16H *55/00, 55/12*
U.S. Cl. 74—229 **11 Claims**



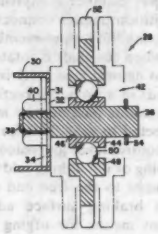
1. A bead chain sprocket comprising a peripherally grooved pulley having spaced side flanges,
a strip of flexible plastic material substantially equal in length to the circumference of the pulley groove and disposed therein between said side flanges,
said strip having one side edge abutting one said pulley flange,
said strip further having bead-engaging pockets confronting and in spaced relation to the other said pulley flange for cooperation therewith in engaging a bead chain.

3,985,038

SELF-ALIGNING IDLER

Gene Roger Fowler, Geneseo, Ill., assignor to Deere & Company, Moline, Ill.

Filed Apr. 14, 1975, Ser. No. 567,854
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.² F16H *7/12*
U.S. Cl. 74—242.1 A **10 Claims**



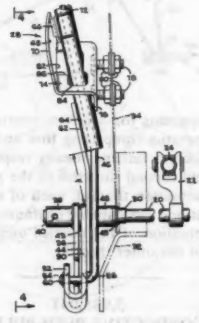
1. In a drive system having an endless flexible drive element trained around rotary drive members, the combination therewith of an improved rotary idler engaging said drive element and comprising: a support; an elongated shaft having an axis extending generally parallel to the axis of the rotary drive members and having a noncircular cross section; means mounting the shaft on the support; an annular bearing having an inner race nonrotatably mounted on the shaft and axially shiftable thereon and a rotatable outer race; an outer rotary idler element connected to the outer race for rotation therewith in engagement with the drive element; and stop means operatively associated with the shaft for limiting the axial shifting of the bearing thereon.

3,985,039

TRANSMISSION CONTROL BRAKE

Joseph A. Federspiel, Port Washington, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 13, 1974, Ser. No. 497,021
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² G05G *11/00, 5/06, 9/00*
U.S. Cl. 74—481 **14 Claims**



1. In a control mechanism for the hydrostatic transmission of a tractor of the type including a rocking foot pedal and a pedal support shaft rotatable by actuation of said pedal to indirectly alter the output torque, driving direction and speed of said transmission, the improvement comprising:

a. a quadrant fixed to said support shaft;
b. a locking rod pivotally connected to said support shaft and releasably connected to said quadrant for movement therewith;
c. a friction pad carried by said locking rod; and
d. a fixed braking surface slidably engaged by said friction pad for braking said support shaft to retain a given rotative position of said shaft when said foot pedal is released, said shaft being movable by pressure on said foot pedal.

13. A control mechanism for a driven hydrostatic transmission having an output member comprising: a rockable shaft having a neutral position; means connecting said shaft to the transmission for driving the output member at varying speeds in a first direction when the shaft is rotated different amounts in one direction past neutral, and for driving the output member at varying speeds in a second direction when the shaft is rotated different amounts past neutral in the opposite direction; a pedal connected to said shaft for rocking the shaft in either direction; a control lever journaled on said shaft; means for selectively latching or unlatching said lever from said shaft; friction means secured to the free end of said lever; means defining a friction braking surface adjacent said friction means; and resilient means for urging said friction means against said friction surface to maintain said shaft in any one of an infinite number of positions when said lever is latched to said shaft and said shaft has been rotated past neutral in one of said direction, said friction surface and said friction means preventing movement of said shaft unless pressure is applied to said foot pedal.

3,985,040

HAND AND FOOT GOVERNOR CONTROL SYSTEM

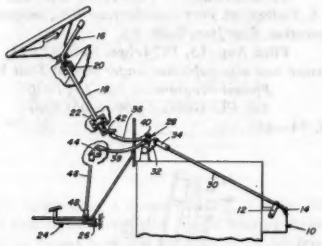
Richard A. Hale, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Nov. 21, 1974, Ser. No. 525,809

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² G05G *11/00, 1/14*

U.S. Cl. 74—482 **8 Claims**



1. Control apparatus for a power control unit of a prime mover, said apparatus comprising first and second throttles, and first and second linkage means respectively extending from the first and second throttles to the power control unit for a selective actuation thereof, each of said linkage means including at least one link capable of transmitting only tension for a tension actuation of the control unit by either throttle independently of the other throttle.

3,985,041

NON-CONDUCTIVE PUSH-PULL CABLE

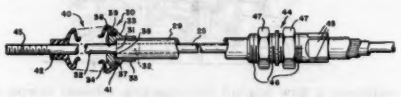
William J. Gilmore, Manitou Beach, Mich., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Jan. 7, 1974, Ser. No. 431,541

Int. Cl.² F16C *1/10*

U.S. Cl. 74—501 P **11 Claims**

8. A push-pull cable comprising;
a. a core of non-conductive flexible elongated material having a predetermined effective outer diameter;
b. an electrically non-conductive flexible inner sheath encasing said core;
i. said inner sheath having an inner diameter slightly larger than the outer diameter of said core to allow longitudinal movement of the core relative said inner sheath;
ii. said inner sheath defining a smooth inner surface on which said core can ride;
c. several strands of polyester material helically wrapped about said inner sheath for absorbing compressive and tensile loads caused by operation of the cable;
i. said strands being wrapped in a non-adhesive relation to said inner sheath and to each other;
d. an outer sheath of flexible non-conductive material covering said strands in a non-adhesive relation, said outer



sheath being of a material for preventing moisture from passing through said outer sheath;
e. one end of said non-conductive cable having sealing means for sealing interstices defined by said core, said inner sheath, said strands, and said outer sheath from moisture;
i. said sealing means including an elastomeric o-ring seal held in abutting engagement with said non-conductive core and a bellows secured at one end to said outer sheath and at the other end to said non-conductive core; and
f. the other end of said cable having adaptor means for attaching said cable to a metallic push-pull cable;
i. said adaptor having seal means for sealing said interstices;
ii. said seal means including at least one elastomeric o-ring seal.

3,985,042

ROTARY MECHANICAL AMPLIFIER OR SWITCHING DEVICE

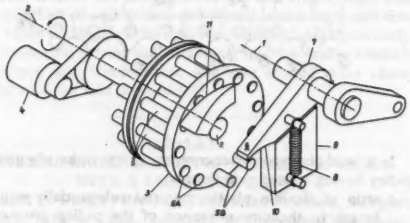
Charly Cornu, Einigen, Switzerland, assignor to Etel S.A., Saint-Sulpice, Switzerland

Filed May 8, 1975, Ser. No. 575,963

Claims priority, application Switzerland, May 21, 1974, 7091/74

Int. Cl.² F16H *53/00*

U.S. Cl. 74—568 R **10 Claims**



1. A rotary mechanical switching device comprising: a rotatable disc-like support; a member mounted for movement in a plane parallel to said support between first and second positions; a plurality of rods carried by said support for rotation therewith, said rods being disposed parallel to the axis of

rotation of said support and regularly spaced apart in a substantially circular configuration concentric to the axis of rotation; said rods being axially slidable relative to said support between a first position out of the parallel plane and the second position in which cylindrical parts of said rods intercept that plane; said member having a surface for tangential engagement with said rods in their second position, selectively to move said member from its first to its second position, and to hold said member in its second position in response to the rotation of said support; and means for selectively moving said rods between their first and second positions; wherein said surface of the member has a curvature which is concentric to a circle at the outer periphery of said cylindrical parts of the rods, when said member is in its second position, and has a length sufficient for two consecutive ones of said rods in their second position to simultaneously engage said surface to hold said member in its second position without vibration.

3,985,043

FLY-WHEEL FOR TAPE RECORDER

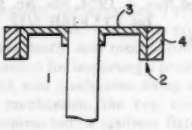
Takehiko Toratani, Iwaki, Japan, assignor to Alps Motorola, Inc., Tokyo, Japan

Filed Jan. 27, 1975, Ser. No. 544,492

Claims priority, application Japan, Feb. 28, 1974, 49-24174[U]

Int. Cl.² F16C *15/00*

U.S. Cl. 74—572 **11 Claims**



1. A fly-wheel for a tape recorder including in combination a capstan shaft, a cup-shaped plate member fixed at its center to said capstan shaft, and a metallic ring-shaped member fixed to the circumferential surface of said cup-shaped plate member, said ring-shaped member substantially having the shape of a section of a hollow metal tube.

3,985,044

FOUR SPEED MANUAL TRANSMISSION WITH CONCENTRIC INPUT AND OUTPUT SHAFTS

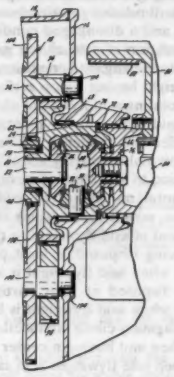
Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1974, Ser. No. 534,516

Int. Cl.² F16H *1/38*

U.S. Cl. 74—710.5 **8 Claims**

1. A power transmission mechanism having manually controlled gear elements for use in an automotive vehicle driveline comprising a power input shaft and a power output shaft concentrically disposed one within the other in a transmission housing, clutch means for connecting the input shaft to an engine crankshaft, input gears connected to the input shaft in coaxial disposition with respect to the output shaft, a pair of countershafts arranged in spaced parallel disposition with respect to the input shaft, torque transmitting drive gears journalled on each countershaft in drive relationship with respect to said input gears, one end of each countershaft having formed thereon an output drive gear, a differential mechanism having a pair of differential side gears and differential pinions driveably connecting the side gears, one side gear being connected to said output shaft, said output shaft and the other side gear being adapted to be connected to driven portions of said mechanism, an output gear carried by said differential mechanism in meshing engagement with said output drive gears, synchronizer clutch means for connecting selectively each of said drive gears to its respective counter-



shaft, said drive gears being in meshing engagement with said input gears.

3,985,045

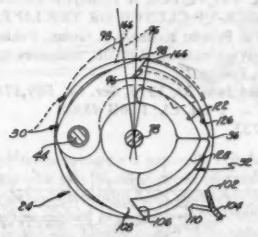
LOCKING DEVICE FOR A DIFFERENTIAL DRIVE MECHANISM

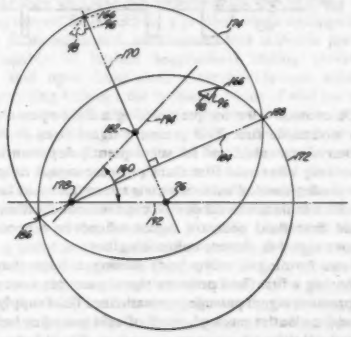
John P. Shilling, and Derold L. Sherrill, both of Marshall, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 17, 1975, Ser. No. 541,816

Int. Cl.² F16H *1/44*

U.S. Cl. 74—711 **16 Claims**





1. A drive mechanism for interconnecting rotatable driving and driven members, said drive mechanism comprising gear means for transmitting drive forces between the driving and

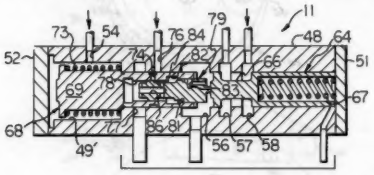
driven members and for enabling relative rotation to occur between the driving and driven members, clutch means operable between an engaged condition in which said clutch means is effective to retard relative rotation between said driving and driven members and a disengaged condition, actuator means for effecting operation of said clutch means from the disengaged condition to the engaged condition, said actuator means including a flyweight having a stop surface with an outermost end, means for rotating said flyweight about a first axis, means for supporting said flyweight for pivotal movement about a second axis under the influence of centrifugal force, said flyweight being pivotal outwardly about said second axis from a retracted position to an extended position, means for blocking outward pivotal movement of said flyweight past said extended position, means for engaging said stop surface upon outward movement of said flyweight to the extended position, said flyweight being disposed at least partially within a first imaginary circle when said flyweight is in said retracted position and being disposed at least partially within a second imaginary circle when said flyweight is in said extended position, said first imaginary circle intersecting said outermost end of said stop surface and having a center which is disposed on said first axis when said flyweight is in said retracted position, said second imaginary circle having the same diameter as said first imaginary circle and having a center which is spaced apart from the center of said first imaginary circle, said second imaginary circle being disposed in the same position relative to said flyweight when said flyweight is in said extended position as is said first imaginary circle when said flyweight is in said retracted position so that said second imaginary circle intersects said outermost end of said stop surface when said flyweight is in said extended position, said outermost end of said stop surface intersecting said second imaginary circle at a point which is disposed further from said first axis than any other point on said second imaginary circle.

3,985,046

CONTROL VALVE FOR A TORQUE CONVERTER LOCK-UP CLUTCH OR THE LIKE

Hugh C. Morris, Peoria; Kenneth F. Golan, Pekin, and James L. Schmitt, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 23, 1975, Ser. No. 589,178
Int. Cl.² F16H 45/02
U.S. Cl. 74—733 **10 Claims**



1. A control valve for pressurizing a fluid-operated device when a variable first fluid pressure signal rises above a first predetermined value, and for subsequently depressurizing said device only after said first fluid pressure signal drops to another predetermined value which is lower than said first value, and which maintains said device unpressurized without regard to said first fluid pressure signal whenever a second fluid pressure signal is absent, comprising:

means forming a valve body having a bore therein and having a first fluid pressure signal passage, a second fluid pressure signal passage, a pressurized fluid supply passage and an outlet passage, each of said passages being communicated with a separate portion of said bore;

a first spool element disposed in said bore for axial movement therein between an unshifted position at which said outlet passage is blocked from said supply passage and a shifted position at which said outlet passage is communicated with said supply passage;

first resilient means urging said spool element toward said unshifted position thereof;

a second spool element disposed in said bore for axial movement therein, said second spool element being movable by fluid pressure received through said second signal passage from one position to another position at which said second spool element urges said first spool element to an intermediate position between said unshifted and shifted positions thereof,

a third spool element disposed in said bore between said first and second spool elements for urging said first spool element still further towards said shifted position thereof, said third spool element having first and second surfaces facing away from said first spool element; and

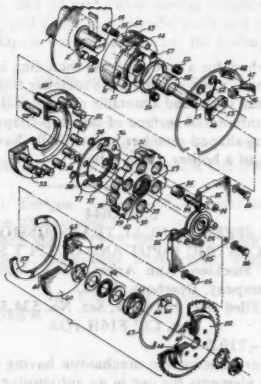
passage means positioned to communicate said first fluid pressure signal passage with said first surface when said first spool element reaches said intermediate position thereof and for communicating said first fluid pressure signal passage with said second surface only after said first spool element has been moved past said intermediate position thereof by pressure acting on said first surface of said third spool element.

3,985,047

WINCH DRIVE MECHANISM

Hans Richard Therkelsen, Delta, Canada, assignor to Mercury Winch Manufacturing Ltd., Canada

Filed Nov. 4, 1974, Ser. No. 520,476
Int. Cl.² F16H 5/52
U.S. Cl. 74—805 **8 Claims**



1. Drive mechanism comprising a stationary member, a first rotatable member rotatable relative to said stationary member, a second rotatable member rotatable relative to said stationary member about the same axis, and means for connecting said second rotatable member to said first rotatable member for conjoint rotation including a pawl carried by said first rotatable member and swingable relative thereto for engagement with said second rotatable member and friction control means engageable between said pawl and said stationary member, rotatable conjointly with said first rotatable member and operable to swing said pawl relative to said first rotatable member into engagement with said second rotatable member.

3,985,048

GRINDING BAND SAW TEETH

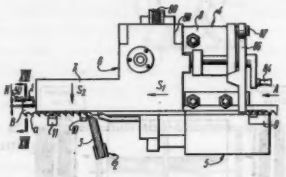
Vladimir Viktorovich Idel, ulitsa Gertsena 3, kv. 37, Zavolzhie Gorkovskoi oblasti, U.S.S.R.

Filed Dec. 11, 1974, Ser. No. 531,722

Claims priority, application U.S.S.R., Dec. 11, 1973, 1973055; Dec. 11, 1973, 1973057; Dec. 11, 1973, 1973058; Jan. 3, 1974, 1979651; Jan. 3, 1974, 1979652; Jan. 3, 1974, 1979653; Jan. 3, 1974, 1979654; Jan. 3, 1974, 1979655; Jan. 3, 1974, 1979656; Jan. 3, 1974, 1979657; Mar. 12, 1974, 2006506; Mar. 12, 1974, 2006507; Mar. 12, 1974, 2006508; Mar. 12, 1974, 2006509; Mar. 12, 1974, 2006510; June 24, 1974, 2032127

Int. Cl.² B23D *63/00*

U.S. Cl. 76—43 18 Claims



1. A band saw tooth grinding machine comprising: a bed; a grinding mechanism having an abrasive wheel and mounted on said bed; a mechanism for imparting a reciprocating feed of the saw to the abrasive wheel in order to grind the front and back edges of the saw teeth, said mechanism being mounted on said bed; a mechanism for imparting a pitch feed of the saw to the abrasive wheel, said mechanism being mounted on said reciprocating feed mechanism, the two mechanisms being kinematically interconnected; a resilient fixture arranged to retain the saw at the side and back surfaces and mounted on said reciprocating feed mechanism; at least two supporting elements mounted in said fixture, one of which supporting elements is located before said abrasive wheel, as viewed in the direction of the saw pitch feed, and serving the purpose of successively making contact with the tip of each saw tooth, and the other supporting element is located after said abrasive wheel, as viewed in the direction of the saw pitch feed, and has two shaped surfaces disposed in relation to each other so as to form a wedge; one of said shaped surfaces of said other supporting element successively making contact with each tooth on the portion of its back edge adjacent to the tooth tip during a part of the saw pitch feed, whereby the saw is retarded and at the same time said portion of the tooth back edge is strengthened and planished; the other shaped surface of said other supporting element being included at an acute angle with respect to a line passing through the tips of the teeth and successively making contact with each tooth on the portion of its front edge adjacent to the tooth tip during the remaining part of the saw pitch feed, whereby said portion of the front edge of each tooth is strengthened and planished, and drive means for driving said mechanisms.

3,985,049

TOOL FOR CUTTING HELIX GROOVES INTO RUBBER ROLL COVERS

Frederick M. Streckfus, 4715 Hydes Road, Hydes, Md. 21082

Filed May 2, 1975, Ser. No. 573,848

Int. Cl.² B23B *29/12*

U.S. Cl. 82—36 R 3 Claims

1. A lathe cutting tool mountable on a lathe assembly for cutting helix grooves into a rubber covered roll, comprising:

a shaft;

cutting blade means;

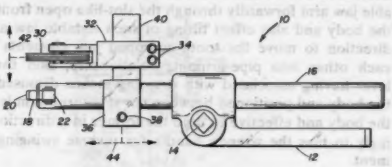
means for mounting the cutting blade means on one end of the shaft;

first bracket means slidably mounted on the shaft, the first bracket means having a bar extending therefrom perpendicular to the longitudinal axis of the shaft;

second bracket means slidably mounted on the bar;

a traction wheel;

means for mounting the traction wheel for rotation on the second bracket means, the traction wheel lying in a plane



parallel to the longitudinal axis of the cutting blade means; and

mounting means for slidably mounting the shaft to the lathe assembly, the shaft being rotatable about its longitudinal axis within the mounting means to adjust the angle of the traction wheel and cutting blade means relative to the roll so as to vary the angle of the helix grooves being cut.

3,985,050

PIVOTED JAW PIPE WRENCH OF THE THREE-ARM LEVER TYPE

Charles L. Lurie, 738 N. Greenwood Ave., Park Ridge, Ill. 60068

Filed May 2, 1975, Ser. No. 573,913

Int. Cl.² B25B *13/28*; B21K *5/16*

U.S. Cl. 81—91 R 5 Claims

1. In a pipe wrench having a generally flat, hollow, narrow body provided with slot-like open front and rear ends, a fixed jaw arm projecting forwardly from said body and carrying a pivoted, tooth-equipped, jaw element at its outer end, a second and movable jaw arm disposed in opposed and spaced relation with the fixed jaw arm, having its inner end region projecting into said wrench body through the slot-like open front end thereof, and carrying a pivoted, tooth-equipped, jaw element at its outer end, said second and movable jaw arm being capable of limited longitudinal sliding movement through said open front end, a turnbuckle-type adjusting screw extending between the medial portions of said jaw arms, pivotally connected to the latter, and adapted upon manipulation thereof to effect movement of the second and movable jaw arm toward and away from the fixed jaw arm in order to regulate the pipe-receiving distance between said pivoted jaw elements, and an operating wrench handle having its forward end projecting into said wrench body through the slot-like open rear end of the latter and pivotally connected to said body at a point inwardly of said rear end, the improvement which comprises a relatively thin, spider-like, three-arm lever of laminated plate construction, disposed within the central region of the body, and having a forwardly projecting lever arm connected pivotally to the body, a rearwardly projecting lever arm designed for camming engagement with the forward end of said wrench handle, and a lateral lever arm pivotally connected to the inner end region of said second and movable jaw arm, the pivotal connection between said lateral lever arm

and the movable jaw arm comprising a semi-cylindrical open sided socket which is formed in the inner end region of said second and movable jaw arm, said socket having a single side wall which overhangs the adjacent side portion of the lateral lever arm in close fitting relationship and thus establishes a protective reinforcing shroud for such lever arm, said lateral lever arm being responsive to swinging movement of the wrench handle in one direction to slide the second and movable jaw arm forwardly through the slot-like open front end of the body and also effect tilting of such slidable jaw arm in a direction to move the tooth-equipped jaw elements toward each other into pipe-gripping relationship, said three-arm lever having associated with it spring means disposed within the body and positioned between the said three-arm lever and the body and effective to urge the former in a direction yieldingly to bias the wrench handle for reverse swinging movement.

3,985,051

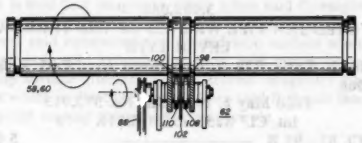
APPARATUS FOR CUTTING AND GROOVING A PIPE

Charles Kepler Brown, Richmond, Va., assignor to Teledyne Mid-America Corporation, Richmond, Va.

Continuation of Ser. No. 431,053, Jan. 7, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,295

Int. Cl.² B22B *3/04*

U.S. Cl. 82—101 **2 Claims**



1. Apparatus for cutting a pipe into two separate lengths and for simultaneously forming annular grooves of controlled depth in the opposite ends of the lengths into which the pipe is cut, said apparatus comprising: means supporting a pipe to be cut for rotation about its longitudinal axis; a tool assembly comprising a shaft rotatable about axes parallel to said longitudinal axis, a cutter blade fixed to said shaft for rotation therewith, grooving blades smaller in diameter than said cutter blade fixed to said shaft for rotation therewith, said grooving blades being on opposite sides of and in spaced relation to said cutter blade, and depth control rollers smaller in diameter than said grooving blades mounted on the shaft on opposite sides of the cutter blade and between said cutter blade and said grooving blades for controlling the depths of the grooves cut by said grooving blades; means for rotating said tool assembly shaft; means for then moving the tool assembly toward said pipe supporting means to engage said depth control rollers with the outer surface of a pipe held therein and thereby bring the cutters and grooving blades into cutting and grooving coaction with said pipe; and means for thereafter rotating the pipe about its longitudinal axis to extend the cut and the annular grooves around the circumference of the pipe, whereby said pipe can be cut in two and said grooves formed in a single pass of the tool assembly around the circumference of the pipe.

3,985,052

CONVEYOR LOADING SYSTEM

James L. Balch; James E. Anderson, and Boleslaus J. Sadeski, all of Madison, Wis., assignors to Oscar Mayer & Co. Inc., Madison, Wis.

Division of Ser. No. 447,392, March 1, 1974, Pat. No. 3,941,234. This application Jan. 8, 1976, Ser. No. 647,575

Int. Cl.² B26D *4/26*, *4/46*, *5/20*

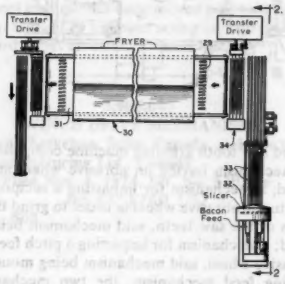
U.S. Cl. 83—69 **8 Claims**

1. A system for loading a finite number of bacon strips, sliced from a bacon slab by a bacon slicer having a cyclically operative slicing blade, side-by-side in transverse rows on a continuously moving conveyor, said system comprising, in combination:

a unidirectionally driven conveyor for conveying said bacon strips away from said slicer;

a cyclically operative transfer carriage for removing said finite number of bacon slices from said conveyor;

a counter responsive to said slicer having completed an operating cycle for maintaining a cumulative count of the number of cycles completed by said slicer, and for producing an output signal upon reaching a predetermined count;



product feed control means operatively associated with said slicer for controlling the feed of said bacon slab to said slicing blade to selectively initiate and terminate the production of bacon slicers by said slicer; and

slicer control means responsive to the initiation of a transfer cycle by said transfer carriage for resetting said counter and for conditioning said product feed control means to initiate production of bacon strips by said slicer as said slicing blade next passes between operating cycles, and further responsive to the output signal from said counter for conditioning said product feed control means to terminate production of bacon strips by said slicer when said finite number of bacon strips have been produced.

3,985,053

DEVICE FOR THE OPENING AND CONVEYANCE OF FRESHLY CUT STAPLE FIBER BUNDLES

Hans Dieter Kayser, Sulzbach, and Wilhelm Dindorf, Obernburg, both of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jan. 21, 1976, Ser. No. 651,088

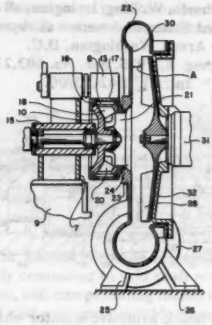
Claims priority, application Germany, Jan. 23, 1975, 2502593

Int. Cl.² D01G *1/04*

U.S. Cl. 83—100 **7 Claims**

1. Apparatus for opening and conveying freshly cut staple fibers comprising a radial blower having its suction opening attachable in close proximity to the cutting zone of a tow staple cutting apparatus, said radial blower having a blade

type rotor, the blades of the rotor being spaced from the inner housing surface of the blower adjacent the cutting zone a



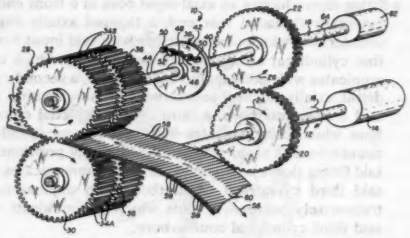
distance at least one half the effective knife length of the staple cutting unit.

3,985,054

CUTTING MECHANISM

Salvatore M. Marino, East Brunswick, N.J., assignor to Fedders Corporation, Edison, N.J.

Filed June 23, 1975, Ser. No. 589,443
Int. Cl.² B26D 1/56; B23D 25/12
U.S. Cl. 83—303 5 Claims



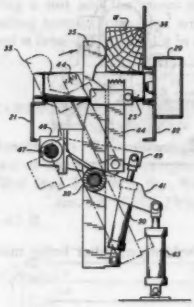
1. A cutting mechanism comprising, in combination: a driving shaft, a first motor for applying a torque to said driving shaft in a direction to rotate said driving shaft in a first direction, a driven shaft, gearing means between said driving and driven shafts for rotating said driven shaft in a direction opposite to said first direction, coacting cutting means on said driving and driven shafts for cutting material received therebetween, and a second motor connected to said driven shaft for continuously applying a torque thereto in a direction which tends to rotate said driven shaft in said first direction, said cutting means comprising coacting toothed cutters on said driving and driven shafts for shearing material received therebetween, said torque produced by said second motor having a magnitude such that the rotational force on said driven shaft due to said second motor is greater than the shearing force between the teeth on said cutters, and the torque produced by said first motor is greater than the torque produced by said second motor, said driven shaft comprising a first section connected to said rotating means, and a second section connected to one of said cutters, and adjusting means comprising an adjustable coupling between said first and second sections for releasably connecting said first section to said second section, whereby said second section may be rotated relative to said first section upon release of said coupling.

3,985,055

SAWMILL APPARATUS

Cyrus J. Cornell, P.O. Box 18, Laceyville, Pa. 18623

Filed June 2, 1975, Ser. No. 582,747
Int. Cl.² B26D 7/06; B27B 25/02, 31/04
U.S. Cl. 83—367 15 Claims



1. A sawmill assembly, comprising, in combination: first conveyor means, a reciprocable cross-cut saw assembly; second conveyor means; a multiple-blade ripping saw assembly, and an operator control station for controlling said first and second conveyor means and said assemblies, said first conveyor means being adapted to receive an elongated piece of lumber and operable under control of said operator to transport said piece endwise in a first direction toward said cross-cut saw assembly, said second conveyor means including a plurality of reciprocable stop means spaced apart in said first direction and selectively operable by said operator to extend into the path of said piece to arrest motion of said piece in said first direction, said cross-cut saw assembly including a powered circular saw blade reciprocable under control of said operator to move in a second direction transverse to said first direction to cut said piece of lumber, said multiple-blade ripping saw assembly including first and second groups of rotatably powered saw blades spaced apart in said second direction, said second conveyor means being operable to transport pieces cut by said cross-cut saw assembly to said ripping saw assembly and including transfer means selectively controllable by said operator to selectively move said cut pieces into alignment with either said first group or said second group of blades of said ripping saw assembly.

3,985,056

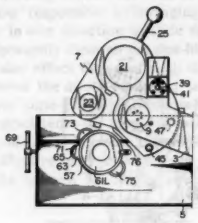
MULTIPLE TOOL HOLDING PUNCHING UNIT

Moichi Oseto, Hatano, Japan, assignor to Amada Company Limited, Isehara, Japan

Filed Mar. 7, 1975, Ser. No. 556,407
Claims priority, application Japan, Feb. 17, 1975, 50-8767
Int. Cl.² B26D 5/08; B26F 1/14
U.S. Cl. 83—552 8 Claims

1. A punching unit comprising a horizontally extending upper arm having a punch holding member pivotally mounted thereon about a vertical axis, said member including a plurality of punch holding bores, a horizontally extending lower arm having a die holding bore formed therein, means for rotating said punch holding member about said axis to index selected ones of said punch holding bores into overlaying registry with said die holding bore, said punch holding member having a configuration defining a sector which does not overlay said die holding bore throughout a given angular extent of the rotation thereof thereby facilitating removal and replacement of dies in said die holding bore, said upper arm having a main body

portion connected to and extending generally parallel to said lower arm, and a free end laterally offset from said main body



portion, said punch holding member being mounted on said free end.

3,985,057

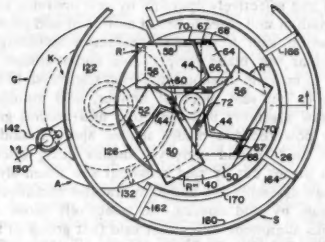
COMESTIBLE SLICING APPARATUS

Louis A. Bettcher, Amherst, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio

Continuation-in-part of Ser. No. 498,394, Aug. 19, 1974, abandoned. This application Feb. 24, 1975, Ser. No. 552,173

Int. Cl.² B26D *4/34, 7/03*

U.S. Cl. 83—703 **5 Claims**



1. In an apparatus for severing parts from a comestible workbody, such as, meat, a frame assembly, a table-like member supported by said frame assembly and having an upwardly facing planar surface, movable cutter means supported by said frame assembly with its cutting edge offset outwardly of said planar surface, a workbody carrier supported by said frame assembly and having a workbody receptacle located outwardly of said planar surface and said cutter means with an open end thereof adjacent to said table-like member, power means for producing relative movement between said carrier and said cutter means in a predetermined path generally parallel to said planar surface of said table-like member to cut a slice from a workbody in said receptacle, said receptacle at least the lower part of which is tubular being inclined at an angle of about 30° to 70° with respect to the upwardly facing planar surface of said table-like member and with the end thereof adjacent to the planar-like surface trailing, and means for varying said outward relative position of said cutter means and said table-like member to vary the thickness of slices cut from the workbodies.

3,985,058

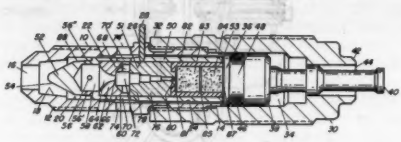
SELF-SEALING FLUIDIC EXPLOSIVE INITIATOR

Anthony P. Corrado, Totowa Boro; Frank Timte, Budd Lake; Edward L. Rakowsky, Kinnelon; Vincent P. Marchese, Morris Plains, and Charles W. Bing, Irvington, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 8, 1975, Ser. No. 603,210

Int. Cl.² F42C *5/00*

U.S. Cl. 89—1 B **2 Claims**



1. A self-sealing fluidic explosive initiator which comprises:

housing means having an internally threaded forward end, a rear end having a piston ram exit hole axially positioned therein, and a piston counterbore disposed intermediate said forward end and said rear end;

piston means slidably positioned in said piston counter bore and having a ram end protruding through said ram exit hole; and

explosive valve means, threadedly attached to said housing means forward end, for moving said piston means from a retracted position to an extended actuating position for terminating a gas supply flow to said explosive valve means, and for containing the explosive products of said explosive valve means after initiation of said piston means, which includes;

a fitting sleeve having an axial input bore in a front end, an externally threaded rear end, a tapered axially aligned counterbore which communicates with said input bore, a first cylindrical axially aligned counterbore which communicates with said tapered counterbore, a second cylindrical axially aligned counterbore communicating with said first counterbore, a third cylindrical axial counterbore which communicates with said second cylindrical counterbore, a shear pin bore transversely positioned in said fitting sleeve so that said pin bore communicates with said third cylindrical counterbore, and a plurality of transversely positioned vents which communicate with said third cylindrical counterbore;

an explosive inner sleeve assembly means, slidably positioned in said fitting sleeve, for fluidically generating temperatures as high as 1000° C. in 10–25 milliseconds, and for explosively shutting off a fluid initiating supply source in less than 100 milliseconds; and

a shear pin positioned in aid shear pin bore of said fitting sleeve and extending into an inner sleeve shear pin bore for holding said inner sleeve means fixedly attached to said fitting sleeve when said initiator is in a "before firing" position.

3,985,059

CLAMPING DEVICE FOR SEALING RINGS ON A TILTABLE CARTRIDGE CHAMBER FOR A WEAPON

Anton Politzer, Lauf, Pegnitz; Hans Sackenreuter, Ruckersdorf, and Wilhelm Machmer, Nurnberg, all of Germany, assignors to DIEHL, Nurnberg, Germany

Filed Mar. 12, 1975, Ser. No. 557,653

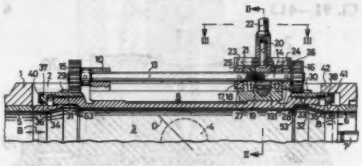
Claims priority, application Germany, Mar. 13, 1974, 2412042; Mar. 13, 1974, 2412043; Apr. 3, 1974, 7411702[U]

Int. Cl.² F41F *1/04*

U.S. Cl. 89—25 **12 Claims**

1. In a clamping device for clamping seal rings at the ends of a tiltable cartridge chamber in sealing position against a

weapon tube at one end of the chamber and a head at the other end of the chamber, clamp shaft means rotatable on said chamber, nuts threaded on the ends of said chamber and supporting said rings, transmission means connecting said shaft means to said nuts to rotate the nuts in response to rotation of the shaft means to move the rings into and out of



sealing position, a lever pivotally supported on the chamber and operatively connected to said shaft means for rotation of the shaft means, and compensating means interposed between said lever and said nuts and operable upon one ring reaching sealing position to permit continued pivotal movement of said lever with continued movement of the other ring toward sealing position.

3,985,060

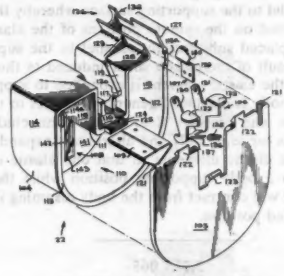
AMMUNITION MAGAZINE FOR AUTOMATIC FIREARMS

James F. Conley, Kennebunk, Maine, assignor to Maremont Corporation, Saco, Maine

Division of Ser. No. 507,997, Sept. 20, 1974. This application Sept. 16, 1975, Ser. No. 614,023

Int. Cl.[2] F41D *9/02*

U.S. Cl. 89—34 **10 Claims**



1. An ammunition magazine for storing rounds of ammunition retained in a split link belt and for supplying the rounds to a firearm, said ammunition magazine comprising a maga[2]zine housing including an open ended housing member having an end wall and side walls defining a chamber for housing the split link belt in a folded condition and a removable cover member closing the open end of the housing member, lock means for retaining the cover member in closing position over the open end of the housing member to protect the ammunition from the environment and for keeping the ammunition stacked in an orderly fashion, the magazine housing having latch formations for attachment of the ammunition magazine to the firearm, means defining a feed outlet from the housing including upwardly inclined substantial parallel spaced flange walls directed to guide the ammunition belt along an upwardly inclined path into the belt receiving portion of the firearm, belt restraining means in the feed outlet for preventing the ammunition belt from sliding back into the ammunition magazine if the ammunition belt is released from the firearm, the open ended housing member defining a semicylindrical lower chamber and two separate rectangular upper chambers opening into the semicylindrical lower chamber and having a connecting wall between said upper rectangular chambers defining a central upper wall for the semicylindrical lower chamber, said lock means comprising snap tabs extending upwardly from the upper edge of the cover member and having a rearwardly directed projection which snaps over an upper wall bounding the upper rectangular chambers when the cover member is installed on the housing member, and said connecting wall having a slot and the cover member having an upwardly extending tongue formation with a projection which mates with and is retained by the slot in the connecting wall.

3,985,061

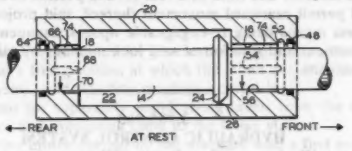
SLEEVE BEARING FOR SUPPORTING RECIPROCATING MEMBERS

Robert S. Montgomery, Schenectady, N.Y., assignor to The United States of America, Washington, D.C.

Filed May 21, 1975, Ser. No. 579,659

Int. Cl.[2] F41F *19/02*

U.S. Cl. 89—43 R **7 Claims**



1. In an assembly having an elongated cylindrical member disposed for reciprocal passage through a supply of hydraulic oil, means for concentrically supporting the cylindrical member, comprising,

at least one fixedly mounted hollow bearing surrounding the cylindrical member in adjacent contact with the supply of oil,

a sealing ring seated within said bearing at the end thereof remote from the oil supply,

said bearing having

a circumferential channel therein located inwardly of said sealing ring,

an oil passage extending axially between said channel and the supply of oil, and

an extremely shallow oil pocket extending axially therein for a distance between one-half and three-quarters of the length between said channel and the end of said bearing remote therefrom,

said bearing being angularly oriented relative to the reciprocating member to locate said oil pocket in the area against which maximum loading by the cylindrical member is anticipated.

3,985,062

FIREARM CONSTRUCTION

Gerhard Hupp, Oberndorf (Neckar), and Helmut Mader, Schramberg, both of Germany, assignors to Industriewerke Karlsruhe-Augsburg Aktiengesellschaft, Germany

Filed Feb. 20, 1975, Ser. No. 551,154

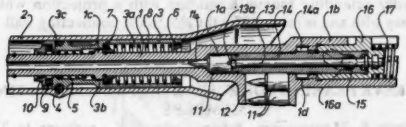
Claims priority, application Germany, Feb. 21, 1974, 2408446

Int. Cl.[2] F41D *15/04*

U.S. Cl. 89—159 **8 Claims**

1. A firearm, particularly a short firearm for firing caseless ammunition, comprising a housing, a barrel displaceably mounted in said housing and having a bore therethrough, first and second springs supported on said housing and biasing said barrel against axial movement in respective opposite directions, said barrel having a breech portion with a cartridge chamber aligned with the bore and a magazine chamber opening into said cartridge chamber, a lock member having a forward end adjacent the barrel bore and being slidable in said cartridge chamber and having a bore therethrough and having

an opposite rear end portion, a firing pin gas piston slidable in said lock member bore and, together with said lock member, sealing said cartridge chamber rearwardly of the cartridge to be fired, a locking slider having an axial bore receiving the rear end portion of said lock member, a firing pin within said back member control pin means engaged between said locking slider and said lock member to rotate said lock member during firing, and relatively axially and circumferentially mov-



able projection and recess means defined between said lock member and said barrel breech portion which are disengaged upon firing and rotation of said lock member to release said lock member and from said rear breech portion of said barrel and permit rearward movement thereof, said projection and recess means being re-engageable upon subsequent forward movement and rotation of said lock member by said control pin means.

3,985,063

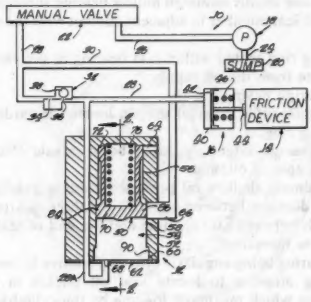
HYDRAULIC CONTROL SYSTEM

Robert W. Lemon, Farmington, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 30, 1974, Ser. No. 501,925

Int. Cl.² F15B *13/04*

U.S. Cl. 91—31 **10 Claims**



1. In a hydraulic control system for controlling an hydraulic motor, an accumulator having a piston, said piston being mounted in a housing, a source of fluid pressure, valve means connected to said source and to said motor, a first fluid connection between said valve means and said motor, restricting means positioned in said first fluid connection; a second fluid connection between said valve means and said accumulator, a third fluid connection between said accumulator and said first fluid connection, said third fluid connection connected to said first fluid connection between said restricting means and said motor downstream of said restricting means, said piston having an inactive position and a fully stroked position, passage means in said accumulator, said passage means connecting said second fluid connection to said third fluid connection when said piston is in said inactive position whereby initially a rapid fluid fill of said motor will be provided, means closing said passage means as said piston moves between the inactive and fully stroked positions of said piston, and means defining a flow path again connecting said second and third fluid connections when said piston reaches said fully stroked position to complete a bypass around said restricting means in said fully stroked position.

3,985,064

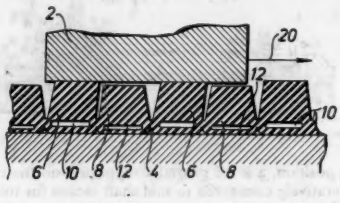
DEVICE FOR DISPLACEABLY SUPPORTING A LOAD

Lars Johnson, Backegardsgatan 20, S-415 06 Goteborg, Sweden

Continuation of Ser. No. 395,580, Sept. 10, 1973, abandoned. This application May 19, 1975, Ser. No. 578,417

Int. Cl.² F15B *11/22, 13/00*

U.S. Cl. 91—413 **6 Claims**



1. A device for displaceably supporting a body in relation to a support surface comprising at least two elastic elements disposed between the support surface and a surface of the body, said elastic elements being attached to each other only adjacent said support surface and being separately and alternately expansible and contractible in a direction from the support surface toward and from the body, the elastic elements having portions remote from the support surface which are free to move by elastic shearing in the elastic element substantially independent of one another in a direction generally parallel to the support surface, each of said elastic elements having chamber means for alternately expanding and contracting the elastic elements so that the elastic elements will be alternately loaded by and unloaded from the weight of the body, means for urging the body to move in a direction generally parallel to the supporting surface whereby the body may be supported on the remote portions of the elastic elements and displaced substantially parallel to the supporting surface as a result of the elastic shear induced in the elastic element when the elastic element is expanded to support the body and the body is displaced generally parallel to the supporting surface, and pressure fluid means connected to the chamber means for separately and alternately expanding and contracting the elastic elements so that one elastic element will expand to a body supporting position while the other elastic element will contract from the body resuming its original nonexpanded position.

3,985,065

RADIAL PISTON MACHINE

Gerhard Nonnenmacher, Korntal, and Roland Steinmann, Stuttgart, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 19, 1975, Ser. No. 578,912

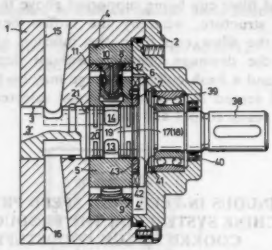
Claims priority, application Germany, May 18, 1974, 2424284

Int. Cl.² F01B *13/06*

U.S. Cl. 91—498 **18 Claims**

1. A radial piston machine, comprising a housing; a shaft in said housing and formed with two axially spaced circumferential grooves bounding first spaces and intermediate said grooves with a high-pressure fluid control opening and with a diametrally opposite low-pressure fluid control opening, sealing lands intermediate said control openings and said circumferential grooves, a first and a second set of supporting lands adjacent said circumferential grooves at the axially outwardly directed sides thereof, a first pair of part-circumferential recesses formed in said first set and axially flanking said high-pressure fluid control opening and a second pair of part-circumferential recesses formed in said second set and axially flanking said low-pressure fluid control opening; a cylinder body rotatably mounted on said shaft and formed with cylin-

der bores having inner ends which intermittently communicate with the respective control openings; pistons reciprocable in the respective cylinder bores; and means communicating



the recesses of at least one of said pairs with at least one space of a plurality of spaces which plurality is constituted by said first spaces and by a second space having a fluid pressure lower than that of said high-pressure fluid control opening.

3,985,066

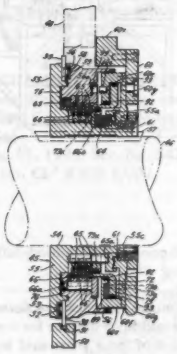
SINGLE POINT MEANS FOR SLOTTER ADJUSTMENT

William M. Kern, New York, N.Y., assignor to S&S Corrugated Paper Machinery Co., Inc., Brooklyn, N.Y.

Filed May 15, 1975, Ser. No. 577,912

Int. Cl.² B31B *1/22*; B23D *1/00*; B26D *1/56*

U.S. Cl. 93—58.2 R **14 Claims**



1. Box making apparatus including a rotationally fixed frame section, a rotationally mounted drive shaft, a first head section keyed to said shaft for rotation thereby, first blade means operatively mounted to said first head section for rotation therewith, a second head section, a second blade means operatively mounted to said second head section for rotation therewith, operating means including a selectively operable clutch for making and breaking a direct driving connection between said first and second head sections, with said driving connection made said second head section being operatively connected to said first head section in a cutting position for rotation therewith, with said connection broken said second head section being operatively connected to said frame section against rotation whereby the angular position of said first blade means may be adjusted relative to said second blade means by rotating said shaft to rotate said first head section.

3,985,067

LABELLING MACHINE FOR GARMENTS

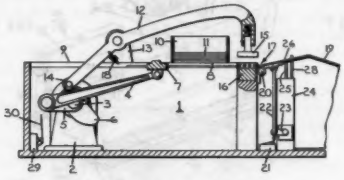
Liberatori Livio, Via Bernardino da Siena; Berneschi Ciro, and Liberatori Lorenzo, both of Via S. Bernardino da Siena 12, all of Arezzo, Italy

Filed Jan. 3, 1975, Ser. No. 538,499

Claims priority, application Italy, Jan. 9, 1974, 1201/74; Dec. 11, 1974, 30403/74

Int. Cl.² B31F *7/00*

U.S. Cl. 93—88 **3 Claims**



1. A labelling machine for garments having a container for labels and a fixing station at which the labels are attached to the garments, said labelling machine comprising:

a. means for separately withdrawing labels from the container and presenting them to the fixing station;

b. a drive motor carried by the machine with a first switch means in circuit therewith for activating said withdrawing and presenting means;

c. a second switch means operatively associated with said drive motor which includes;

i. a micro-switch disposed for actuation by said withdrawing and presenting means;

ii. a coil member in circuit with said micro-switch; and

iii. a relay switch connected to said coil member for interrupting power to said drive motor upon energizing said coil by said micro-switch during attachment of a label at the fixing station, said fixing station including:

A. a swing plate pivotally carried on the machine defining a supporting plane for the garment and label to be fixed thereon;

B. a stationary fixing device for attaching a label to a garment operatively associated with said swing plate;

C. means disposed for engagement by said swing plate for actuating said fixing device; and

D. detector means interconnecting said swing plate with said second switch means for preventing actuation of said withdrawing and presenting means when a label is in the fixing station and with said first switch means for automatically actuating the same upon removal of the labelling garment from the fixing station.

3,985,068

MOUNTING ASSEMBLY FOR AIR CONDITIONING TERMINALS

Carl C. Herb, Camillus, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed June 10, 1975, Ser. No. 585,559

Int. Cl.² F24F *7/00*

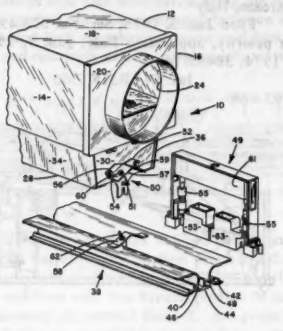
U.S. Cl. 98—40 D **3 Claims**

1. An assembly for releasably connecting a diffuser section of an air conditioning terminal having a pair of opposed spaced end walls comprising:

first and second mounting brackets respectively permanently affixed to one of said spaced end walls, each bracket including generally inverted V-shaped arm portions, with one of said arm portions having retaining means permanently affixed thereto; and

third and fourth mounting brackets respectively permanently affixed substantially adjacent each end of said diffuser section, with each bracket including generally

V-shaped arm portions, with the angle between the arm portions of said third and fourth brackets being substantially equal to the angle between the arm portions of said



first and second brackets, each of said third and fourth brackets further including removable securing means alignable with said retaining means to connect said diffuser section to said end walls of said terminal.

3,985,069

COFFEE BEVERAGE DRIP BREWER

Frank J. Cavalluzzi, 143-35 Quince Ave., Flushing, N.Y. 11355

Filed Dec. 3, 1973, Ser. No. 420,871
Int. Cl.² A23F 1/00
U.S. Cl. 99—295 **8 Claims**

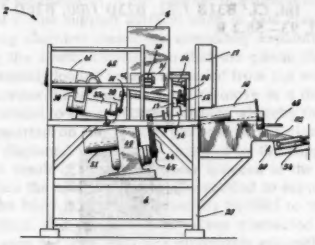
1. A coffee beverage drip brewer adapted for the brewing of a single serving of the coffee beverage comprising a frustoconical body having an upwardly and outwardly flaring skirt extending from a generally planar circular end and terminating at a circular open top, the skirt extending outwardly at an angle substantially ranging between 40° and 50° from a horizontal plane such that the body may be received within a wide range of single serving drinking vessels with the skirt in abutting contact against the mouth of the vessel, said body further being geometrically proportioned to accommodate a particular measure of water, the lower end of the body defining a plurality of drainage openings, a filter cup conforming to the frustoconical body, means forming an annular groove on the interior surface of the skirt, a partition disc adapted for snap fitting assembly within the body with the peripheral edge of the disc being seated within the annular groove for lockingly engaging the side wall of the filter cup between the partition disc and annular groove, said partition disc being positioned in overlying relationship with respect to the filter cup to provide an enclosed infusion chamber for holding a measure of roasted and ground coffee, said coffee occupying a volume within the infusion chamber being substantially less than the volumetric capacity of the chamber to compensate for swelling of the coffee ground during the brewing operation, an outflow control means for permitting controlled gravity flow of a charge of hot brewing water through said body for optimizing the coffee extraction rate including a plurality of apertures in the partition disc permitting entrance of brewing water into the infusion chamber and the brewing of the coffee, and further including a rib structure on the lower end of the body, said filter cup being supported above the lower end by said rib structure, whereby the coffee beverage flowing through the filter cup from the infusion chamber passes through the drainage openings without deposit of coffee grounds and a fresh coffee beverage may be brewed directly over and served in a drinking vessel selected from a wide range of vessel shapes and sizes.

3,985,070

CONTINUOUS IN-FEED HIGH SPEED PRE-COOKING MACHINE SYSTEM FOR THE PRODUCTION OF COOKED DOUGH FOODSTUFFS

John G. Longenecker, Ozone Park, N.Y.; Manuel J. Rubio, Bridgeport, and Ciro M. Robustelli, Stamford, both of Conn., assignors to Roberto Gonzales Barrera, Monterrey, Mexico

Continuation of Ser. No. 415,406, Nov. 13, 1973, which is a division of Ser. No. 171,068, Aug. 12, 1971, Pat. No. 3,773,520. This application June 6, 1975, Ser. No. 584,408
Int. Cl.² A23L 1/10
U.S. Cl. 99—353 **5 Claims**

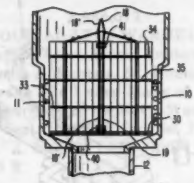


1. A high speed cooked dough foodstuff producing machine system comprising:
- a flour hopper,
- a pre-cooking mixer-extruder and former,
- a feed screw in said flour hopper for conveying and measuring an amount of flour from said hopper to said mixer-extruder,
- a hot liquid feed metering and temperature control system leading into said mixer-extruder,
- said mixer-extruder including a composite extruder screw,
- said composite extruder screw having a mixing section and a feed section so that in one portion of the mixer-extruder the flour and liquid fed therein are thoroughly mixed into a dough and in another portion of this mixer-extruder the dough is advanced to the mixer-extruder exit,
- a shaping die located at the mixer-extruder exit through which dough is extruded.
- a rotary cutter die disc located downstream of said shaping die to sever extruded dough into dough blanks, and
- a conveyor for conveying the dough blank to an oven for cooking, and
- the actions of said feed screw, extruder screw, rotary die cutter disc and conveyor all being capable of being controllably regulated and synchronized with one another and the entire system.

3,985,071
BASKET FOR USE IN DEEP FAT COOKING OF COMESTIBLES

Eugene A. Pottinger, and Winston L. Shelton, both of Louisville, Ky., assignors to Collectramatic, Inc., Jeffersontown, Ky.

Filed Nov. 26, 1975, Ser. No. 635,412
Int. Cl.² A47J 37/12
U.S. Cl. 99—403 6 Claims

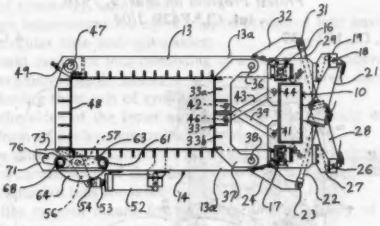


1. A basket for use in the deep fat cooking of comestibles comprising, first and second generally vertical perforate sidewall portions hingedly secured to each other and movable between an opened basket-loading-and-unloading position and a closed-basket position, said basket when in said closed position providing a shelf being adapted to fit adjacent the interior wall of a cooking vessel, each of said sidewall portions having at least one generally horizontal perforate shelf rigidly secured thereto and projecting into the portion of said space defined by its companion sidewall portion when the basket occupies its closed position, said shelves being spaced vertically from each other, and means attached to each of said sidewall portions and extending upwardly to form a pair of cooperating handles for use in the manipulation of said basket.

3,985,072
BALING CHAMBER CONSTRUCTION

Donald W. Van Doorn; Roy T. Williams, and James B. Hawkins, all of Columbus, Ga., assignors to Lummus Industries, Inc., Columbus, Ga.

Filed Jan. 17, 1975, Ser. No. 542,038
Int. Cl.² B30B 15/04
U.S. Cl. 100—255 10 Claims



1. In a baling chamber for fibers and the like,

a. a main supporting structure,

b. a pair of side walls pivotally associated with the supporting structure and disposed when closed to form opposite sides of the chamber,

c. an end wall pivotally mounted adjacent the free end of one of the side walls and disposed when closed to form one end of the chamber,

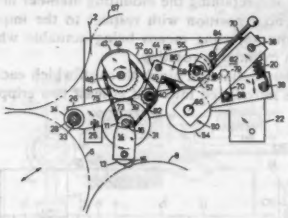
d. a wall for the opposite end of the chamber split into two sections, said sections being pivotally mounted to the side walls intermediate the pivoted and free ends thereof, and

e. linkages pivotally connected to the split sections of said end wall and to the supporting structure, whereby upon opening the side walls the sections of said split end wall move away from each other.

3,985,073
NUMBERING HEAD ATTACHMENT FOR A PRINTING PRESS

James J. Keller, 204 S. 6th, Mount Horeb, Wis. 53572

Filed June 30, 1975, Ser. No. 591,290
Int. Cl.² B41L 49/02
U.S. Cl. 101—76 7 Claims



1. An offset printing machine for printing individual sheets simultaneously with a printing impression and also with a consecutive number for each sheet, said machine comprising, an impression cylinder, a blanket cylinder shiftably mounted between a non-printing position away from said impression cylinder and a printing position in which it abuts in rotatable engagement with said impression cylinder, a consecutive numbering head shiftable between a position away from said impression cylinder and a printing position adjacent said impression cylinder, pivotable linkage connecting means interconnecting said blanket cylinder and said numbering head for shifting said numbering head between said positions and for synchronizing movement of said blanket cylinder and numbering head whereby when said blanket cylinder is shifted to said printing position in contact with said impression cylinder, said numbering head is also shifted from said position away from said impression cylinder to said position adjacent said impression cylinder, said pivotable linkage connection means including a pair of pivotable arms, each of said arms including one end resting on said blanket cylinder and an other end supporting said numbering head, and said arms being pivotably secured intermediate said ends, and means for forcing said numbering head into engagement under pressure with said impression cylinder when said blanket cylinder is shifted to said printing position, said forcing means including a camming means and a rotatable shaft rotatably supporting said camming means, said camming means being operably connected to said other ends of said pivotable arms.

3,985,074
OFFSET PRINTING MACHINES

Francois Henry Rudolphe Bonsch, Le Vesinet, France, assignor to Roneo Vickers Limited, Croydon, England

Continuation-in-part of Ser. No. 363,886, May 25, 1973, abandoned. This application May 1, 1975, Ser. No. 573,758
Claims priority, application United Kingdom, May 23, 1972, 24274/72
Int. Cl.² B41F 1/30, 21/04
U.S. Cl. 101—410 13 Claims

1. An offset printing machine comprising:

a master cylinder adapted to hold a master;

a blanket cylinder adapted to hold a blanket;

an impression cylinder adapted to hold a sheet of paper for receipt of an impression transferred thereto from a master on the master cylinder by a blanket on the blanket cylinder;

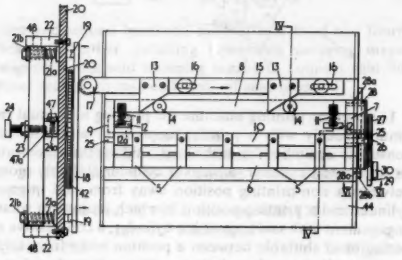
at least two grippers for gripping the forward edge of a sheet of paper between the blanket on the blanket cylinder and the impression cylinder at each appropriate instant in each cycle of operation of the machine;

a rigid mounting member having said at least two grippers mounted thereon;

means mounting the mounting member on the impression cylinder for movement circumferentially of the impression cylinder to vary the relative position of the sheet of paper and the impression cylinder while the paper cylinder is rotating, to adjust the position of the impression provided by the blanket in the direction of motion of the paper around the impression cylinder;

adjusting means for moving the mounting member circumferentially and retaining the mounting member in a fixed circumferential position with respect to the impression cylinder, the adjusting means being actuable while the impression cylinder is rotating;

a pair of rollers defining a pinch through which each sheet of paper is introduced into said at least two grippers;



a first lever mounting one of the rollers;

a cam follower secured to the first lever;

a circular wheel with a cam depression for moving said first lever to open and close the pinch of the pair of rollers;

means for driving the circular wheel in synchronism with the impression cylinder;

means mounting the cam follower roller for movement in a direction substantially circumferential of the circular wheel;

a second lever connected to the cam follower roller for moving the cam follower roller substantially circumferential of the circular wheel; and

means connecting said second lever with said adjusting means;

whereby movement of said at least two grippers circumferentially of the impression cylinder causes a corresponding movement of the cam follower roller substantially in the direction of feed of the paper sheets and the leading edge of each paper sheet is adjusted as the position of the grippers is adjusted.

3,985,075

MULTI-DIRECTIONAL FIRING DEVICE

Stanley Kulesza, Brooklyn, N.Y., and William D. Robison, Cedar Grove, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 19, 1975, Ser. No. 559,951

Int. Cl.² F42B *23/26*

U.S. Cl. 102—8 **5 Claims**

1. A multi-directional firing device comprising in combination:

a housing;

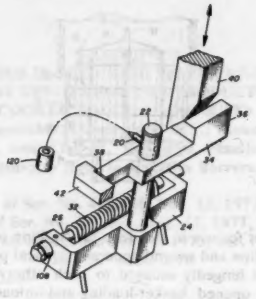
a firing pin carried on a shaft positined on a pivotal mounting in said housing;

biasing means for rotating said shaft through an angular stroke to impinge the firing pin on a detonator;

a lever having two ends and pivotally positioned on said shaft;

a first slider means protruding through and movable within said housing and operatively engaging one end of said lever means;

a second slider means protruding through and movable within said housing operatively engaging the other end of said lever means and adapted to travel along a different axis than said first slider means, whereby the firing pin is



retained in the armed position when both ends of said lever means are engaged by said slider means and released to strike the detonator when at least one of said slider means, by a force applied to its protruding part, is caused to travel a sufficient distance in either forward or rearward directon to cam said lever means through a sufficient angle to disengage an end of said lever means and thereby release said biased shaft to rotate and impinge said firing pin on the detonator.

3,985,076

GAS GENERATOR

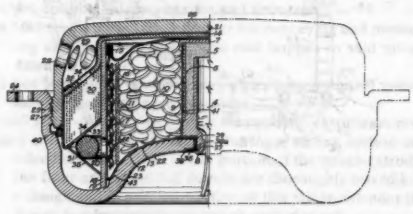
Fred E. Schneiter, North Ogden; Arnold R. Thompson, Brigham City; Leland E. Davis, Brigham City, and George F. Kirchoff, Jr., Brigham City, all of Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Nov. 19, 1973, Ser. No. 417,349

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² F42B *3/04*

U.S. Cl. 102—39 **4 Claims**



1. A gas generator comprising:

ignition means;

gas generant composition annularly surrounding the ignition means in contact therewith;

a rupturable, hermetically sealed container enclosing the ignition means and gas generant;

an inner housing enclosing the container and having peripheral orifices through which the container may be ruptured for expulsion of gases;

an annular filter inside the container, adjacent the orifices of the inner housing;

an outer housing surrounding the inner housing, defining an annular chamber therewith, and having peripheral orifices for expulsion of gases into an inflatable structure; and

cooling means in the annular chamber between the orifices of the inner and outer housings, so that gases produced by the gas generant may pass therethrough.

3,985,077

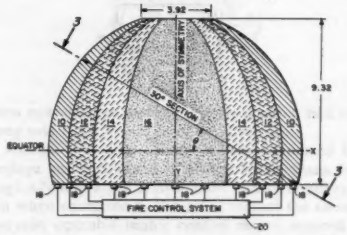
OGIVAL LENS WARHEAD

Robert L. Conger, Newport Beach; Frederic L. Menz, China Lake, and Charles A. Roberts, Jr., Huntington Beach, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 15, 1972, Ser. No. 290,419

Int. Cl.² F42B *1/00*

U.S. Cl. 102—56 R **8 Claims**



1. An explosive missile warhead for producing a spray blast toward a target, operable to be aimed without physical rotation of the warhead and fired in any given direction about the axis of symmetry, comprising:

a. an inhomogeneous ogive shaped explosive lens having a circular base and ogive sides;

b. said explosive lens consisting of a plurality of spheroidal explosive shells about a spheroidal explosive core all having their axis of symmetry coaxial;

c. the sides of the inner said explosive shells being in the form of prolate spheroids;

d. a plurality of detonators mounted and spaced about the circumference of the circular base of said ogive shaped explosive lens for initiating said explosive lens;

e. fire control means for selecting and firing any of said detonators upon command;

f. said ogive shaped explosive lens operable to be aimed by selectively firing a detonator on the opposite side of the warhead from the desired direction of aim;

g. said explosive lens warhead upon detonation of any one of said detonators operable to cause detonation waves to progress from the point of detonation through the entire warhead detonating all the explosive therein such that the detonation waves are focused and converge on a line on the opposite curved surface lying in a plane which passes through the axis of symmetry of the ogive shaped explosive, thus providing a spray blast of warhead fragments in an arc outward from said surface along said line in the direction of aim.

3,985,078

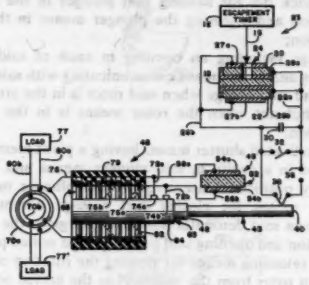
POWER SUPPLY

Edward J. Hart; James E. Leeman; Hugh R. MacDougall; John J. Marron, all of Albuquerque, N. Mex., and Calvin C. Smith, Amarillo, Tex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 11, 1975, Ser. No. 612,394

Int. Cl.² F42B *3/14*; F42D *7/00*; F42C *19/12*

U.S. Cl. 102—70.2 R **11 Claims**



1. An electric power supply comprising first and second ferroelectric current generators; a magnetic field current generator; means for delivering an impulse to and activating said first ferroelectric current generator to generate a first electric current; means including a detonator and an explosive adjacent both said second ferroelectric generator and said magnetic field generator for employing said first electric current and activating said second ferroelectric current generator and generating a second electric current; means for coupling said second electric current to said magnetic field current generator, said magnetic field current generator generating a third electric current in response to activation of said explosive; and means for coupling said third electric current to an output terminal.

3,985,079

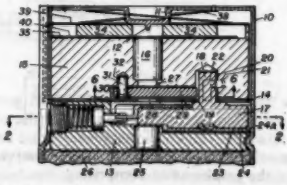
SELF-DESTRUCT FUZE FOR SPINNING ARTILLERY PROJECTILE

Lloyd D. Post, Mount Fern; William J. Holley, Sparta; Stephan Kosonocky, Whippany, and John J. Dineen, Wharton, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 20, 1975, Ser. No. 623,684

Int. Cl.² F42C *15/26*

U.S. Cl. 102—80 **7 Claims**



1. A self-destruct fuze adapted to function on a spinning artillery projectile on terminal deceleration of the projectile when the primary fuze, such as a mechanical time fuze, fails to function, which comprises:

a housing comprising a front end having an inwardly projecting firing pin means and a rear end base member having positioned therein a lead charge and a booster charge;

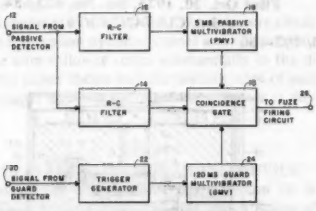
a plunger means positioned in said housing;
a stab detonator positioned in said plunger and aligned with said firing pin;
a means to prevent rotation of the plunger relative to the housing;
a spin actuated rotor means positioned intermediate said plunger means and said base member and having an integral pivot member positioned in a cavity in the rear end of said plunger means;
a lock pin mounted on said rotor pivot member;
an L-shaped groove in said plunger cavity to slidably receive said lock pin for holding said plunger in the unarmed position and releasing the plunger means in the armed position;
a passage including an opening in each of said plunger means and rotor means communicating with said detonator and lead charge when said rotor is in the armed position but not when the rotor means is in the unarmed position;
a spin activated shutter means having a pivot member positioned in a cavity in said plunger means and being biasedly positioned intermediate said plunger means and rotor means for closing said passage communicating between said detonator and lead charge in the unarmed position and opening said passage in the armed position;
a rotor retarding means for slowing the rotation of the spin driven rotor from the unarmed to the armed position;
a spin-activated detent means biasedly positioned intermediate said firing pin means and plunger means for releasably holding said plunger means from operative contact with said firing pin means in the unarmed position;
a rotor spin detent means positioned in said base member for releasably engaging the rotor means in the unarmed position;
a plunger biasing means for preventing said detonator from operatively contacting said firing pin means in the armed position until the projectile deceleration force exceeds that of said biasing means.

3,985,080

TWO SELECTOR GATE FOR ACTIVE-PASSIVE RADIO PROXIMITY FUZES

Raymond T. Kostecki, Chicago, Ill., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 30, 1967, Ser. No. 679,261
Int. Cl.² F42C *13/04*
U.S. Cl. 102—70.2 P **5 Claims**



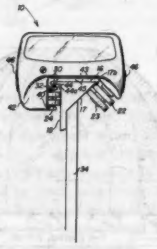
1. A two selector gate for use in active-passive radio proximity fuzes, the combination comprising:
a. a first input terminal for receiving input signals representing the presence of a target,
b. a second input terminal for receiving input signals representing the presence of jamming signals.
c. a coincidence gate circuit having first, second, and third inputs and an output,
d. a first pulse generating means coupled to said first input terminal and to the first of said inputs of said coincidence gate circuit for providing a first enabling pulse to said coincidence gate circuit in response to a sharp increase in signal strength at said first input terminal,
e. a second pulse generating means coupled to said second input terminal and to the second input of said coincidence gate circuit for providing a second enabling pulse to said coincidence gate circuit in response to a decrease in signal strength at said second input terminal,
f. filter circuit means coupling said first input terminal to the third input of said coincidence gate circuit for coupling a signal having a sharp increase in signal strength to the third input of said coincidence gate circuit,
g. said coincidence gate circuit being responsive to the simultaneous presence of said first pulse, said second pulse, and said third input signal for passing said third input signal to the output of said coincidence gate circuit.

3,985,081

RAIL TRANSPORTATION SYSTEM

Ennis Cornelius Sullivan, II, 3947 Cedar Bayou, Dallas, Tex. 75234

Filed Mar. 13, 1975, Ser. No. 557,991
Int. Cl.² B61B *13/04*
U.S. Cl. 104—23 FS **15 Claims**



1. A transport system comprising:
a track including a horizontal top rail with a vertical web extending downwardly therefrom and a canted surface extending between one edge of said horizontal rail and said web, said canted surface being adapted with a raised protrusion formed thereon and extending longitudinally along the length of said track; and
a transport unit mounted on said track having a motorized rotational support pivoted on said unit for tracking along a vertical surface of said web and a counterbalance rotational support pivoted on said unit for tracking on the canted surface of said track, said counterbalance rotational support having a circumferential groove therein for mating with said raised protrusion to restrain the movement of said counterbalance rotational support across the surface of said canted surface, said unit having its center of gravity acting outside the surfaces of contact between said rotational supports and said track and to the side of said vertical web on which said motorized rotational support tracks.

3,985,082

ELECTRIC WALKER

Dragoje R. Barac, 639 Shatto Place, Los Angeles, Calif. 90005

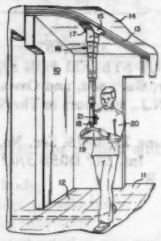
Filed Apr. 2, 1975, Ser. No. 564,487
Int. Cl.² B61B *3/02*
U.S. Cl. 104—89 **5 Claims**

1. An electric walker for aiding a patient to walk along a given path on the floor of at least one room having a ceiling, comprising, in combination:
a. an overhead track means secured to the ceiling vertically above said given path and following the direction of said path;

b. a carriage having roller means engaging said track means so that said carriage can move along said track means;

c. telescoping column means including a first hollow elongated member secured at its upper end to said carriage and at least one additional hollow elongated member telescopically received in the lower end of said first member and extending vertically downwardly to terminate at its lower end in support means at a selected level above said floor, said first member and additional member being square in cross section so that they are keyed against rotation relative to each other so that said support means remains in a consistent orientation relative to said carriage;

d. a first electric motor supported by said carriage and coupled to said roller means for driving said roller means



when energized to thereby positively move said carriage along said track means in either direction;

e. a second reversible electric motor supported by said carriage and connected to said column means for telescopically operating said column means in either direction when energized to extend or retract the same; and,

f. manually operable motor control means secured to the lower end of said column means adjacent to said support means for energizing said first and second motors respectively whereby the patient may be supported by said support means and aided in movement along said path by said first motor, said manually operable motor control means further including means for varying the speed of said first motor so that a patient can adjust the speed at which he walks while supported by said support means.

3,985,083

SUPPORT STRUCTURE

Giancarlo Pofferi, Rome, Italy, assignor to Ufficio Tecnico Ing. A. Mannucci, Florence, Italy

Continuation-in-part of Ser. No. 537,713, Dec. 31, 1974, Pat. No. 3,912,410, which is a division of Ser. No. 302,403, Oct. 31, 1972, Pat. No. 3,873,219. This application Mar. 18, 1975, Ser. No. 559,594

Claims priority, application Italy, Nov. 5, 1971, 9748/71

Int. Cl.[2] A47B *43/00*; A47F *5/01*

U.S. Cl. 108—111 **4 Claims**

1. A support structure comprising:

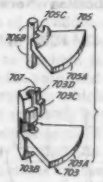
a first upright tubular member;

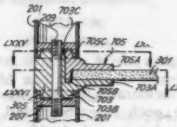
a partition disposed across one end of the first tubular member having an outwardly facing depression formed therein, the side walls of which define a frustum cone surface;

a bracket having an opening extending axially therethrough and having first and second opposed ends each of which defines a frustum cone surface, said first end engaging said depression, the bracket including first and second separately formed interlocking sections each of which incorporates an outwardly extending flange, the flanges defining opposed horizontal surfaces;

a second upright tubular member axially aligned with the first tubular member;

a partition disposed across the end of the second tubular member having an outwardly facing depression formed therein the side walls of which define a frustum cone surface that engages the second end of the bracket;





a stem passing through the opening of the bracket and engaging the partitions of the first and second tubular members; and

a horizontal shelf engaged between the horizontal surfaces of the bracket flanges.

3,985,084

GRATING WITH PUSH BARS FOR AN INCINERATOR

Lucien Delaplace, Sevres, France, assignor to Stein Industrie, Velizy Villacoublay, France

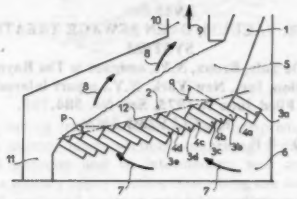
Filed Oct. 4, 1974, Ser. No. 512,324

Claims priority, application France, Oct. 9, 1973, 73.36004

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.[2] F23G *5/00*; F22B *1/22*

U.S. Cl. 110—8 R **10 Claims**



1. A grating for an incinerator of combustible waste comprising a plurality of parallel juxtaposed bars disposed transversely in the incinerator and extending lengthwise thereof to provide a support surface on which waste is advanced in the course of combustion thereof, said bars being arranged in two sets alternating with one another, the bars of one set being fixed and the bars of the second set being reciprocally movable, the bars of said one set being secured in successive gradually lowered positions in the incinerator to provide a downward inclination of about 15° with the horizontal in the lengthwise direction of advancement of the waste, said bars of both sets being inclined with the horizontal at an angle of about 30° in a direction opposite said downward inclination in the lengthwise direction.

3,985,085

COMBINED INCINERATOR FOR OIL SLUDGE AND SOLID WASTES

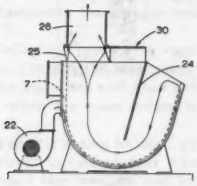
Henrik Anton Schröder, Fredrikstad, Norway, assignor to A/S Fredriksstad mek. Verksted, Norway

Filed May 27, 1975, Ser. No. 581,182

Claims priority, application Norway, May 30, 1974, 1966/74

Int. Cl.² F23G 5/12

U.S. Cl. 110—8 C 7 Claims



1. Combined incinerator for fluid waste, such as oil sludge, and solid waste, such as garbage and refuse, comprising a combustion chamber provided with access means for introducing said wastes, means for discharge of combustion products, such as ash and exhaust gas, means for introduction of combustion air, a main burner for fluid wastes, and at least one auxiliary burner for fuel oil and means for forced circulation of the combustion air, and means for circulation of cooling air on the outside of the combustion chamber, characterized in that said combustion chamber - in one vertical cross-sectional plane — is U-shaped with opposite upright legs, and in one other vertical cross-sectional plane, normal to the first one, represents a rectangular form with substantially vertical opposite side walls, a roofing closing the combustion chamber, and in that said main burner for fluid waste and the means for introduction of combustion air, are located in the roofing adjacent the top of one leg in the U, and in that the exhaust gases are discharged through the roofing adjacent the top of the other U and in that said roofing is provided with a separate access opening (34) in its center-portion between said legs for letting in said solid wastes.

3,985,086

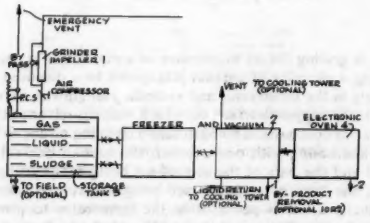
FREEZER, VACUUM, OVEN SEWAGE TREATMENT SYSTEM

Vincent D. De Tola, Bronx, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 9, 1975, Ser. No. 584,705

Int. Cl.² F23G 5/02

U.S. Cl. 110—8 P 2 Claims



1. A sewage treatment system for treating raw sewage, garbage, waste, and the like, said sewage treatment system comprising

freezing and evacuating means for freezing raw sewage, garbage, waste, and the like and drawing off water from the frozen material by vacuum;

grinding and impelling means for grinding and supplying raw sewage, garbage, human waste, and the like to the freezing and evacuating means under pressure and non-vented;

oven means for reducing the matter to ash;

gas and compressed air means for supplying the frozen matter from the freezing and evacuating means to the oven means;

vacuum pump outlet means for venting the system;

water storage means; and

means for supplying water derived from the raw sewage, garbage, waste, and the like, by the freezing and evacuating means to the water storage means for recycling as refrigerant and thence to ground.

3,985,087

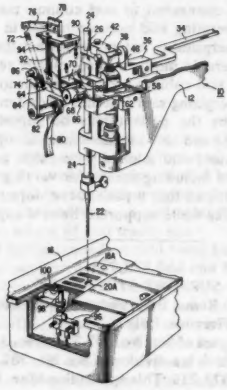
SAFETY LOCKOUT SYSTEM FOR SEWING MACHINES

John Addison Herr, Garwood, and Oswald Mead Porter, Livingston, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed June 23, 1975, Ser. No. 589,167

Int. Cl.² D05B 3/02

U.S. Cl. 112—158 R 20 Claims

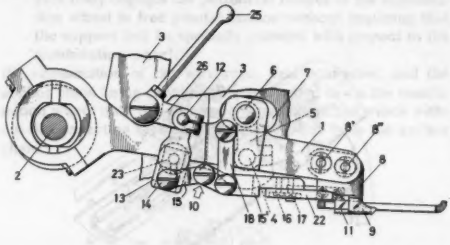


1. In a sewing machine having a frame, a needle bar disposed for endwise reciprocation in said frame, a needle bar jogging means for selectively initiating relative lateral movement of said needle bar for producing zig-zag stitches whereby the sewing machine is operable in straight stitch and zig-zag modes, a work engaging presser mechanism including control means for selectively lifting said presser mechanism away from a work engaging position and lowering said presser mechanism toward a work engaging position, and means operably connecting said presser mechanism with said jogging means for disabling said jogging means in response to actuation of said presser mechanism control means.

3,985,088
CLOTH FEED DEVICE FOR BLIND STITCH SEWING MACHINE

Masato Sugahara, 3-chome, 28-12 Nishi Asakusa, Taito, Tokyo, Japan

Filed Jan. 16, 1975, Ser. No. 541,571
Claims priority, application Japan, Mar. 12, 1974, 49-028934
Int. Cl.² D05B *1/24*
U.S. Cl. 112—178 **1 Claim**



1. A cloth feed device for a blind stitch sewing machine comprising:
- a sewing machine body;
- a main shaft mounted on said body;
- a frame mounted on said body;
- a cloth feed lever connected at one end to said main shaft in eccentric relationship and mounted on said frame so as to allow vertical and transverse movements;
- a main feed rack mounted on the other end of said cloth feed lever;
- a pair of transmitting links connected to each other;
- a supporting lever attaching one of said transmitting links to said cloth feed lever;
- an auxiliary feed rack mounted on an end of said one of said pair of transmitting links and disposed along side and parallel to said main feed rack;
- an adjustable locking link loosely fitted to said frame and connected to an end of the other of said pair of transmitting links opposite to said auxiliary feed rack;
- a slider engaging said adjustable locking link and coupling it to said cloth feed lever; and
- an adjusting lever supported by said frame and connected to said locking link, whereby said main feed rack and said auxiliary feed rack operate at different feed rates and the feed rate of said auxiliary feed rack can be adjusted by moving said adjusting lever.

3,985,089
COMBINATION FRIEZÉ AND SAXONY CARPET

Anthony J. Yacono, New Holland, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

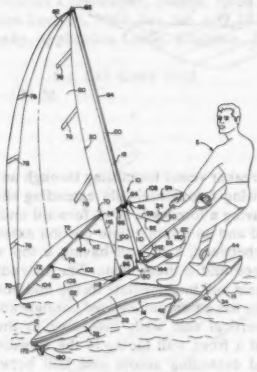
Filed June 23, 1972, Ser. No. 265,733
Int. Cl.² D05C *15/34*
U.S. Cl. 112—266 **1 Claim**

1. The method of forming a carpet with a combination frieze and saxony visual effect, comprising the steps of, forming a conventional slub yarn which has sections of the yarn with a large diameter relative to other sections of the yarn which are of a relatively small diameter, said diameter relationship being established by the difference in the diameters and yarn weight of the individual sections which form the slub yarn, additionally twisting the slub yarn to a very high twist to place additional twist into the slub yarn, permitting the additional twist in the large diameter sections of the slub yarn to be transmitted by the yarn to the small diameter sections of the slub yarn so that the large diameter sections of the slub yarn are relatively free of the additional twisting and the small diameter sections of the conventional slub yarn are greatly twisted and the yarn as a whole tends to twist about itself, setting the twist within the yarn, and then tufting the yarn into a carpet backing to form tufts which are either tightly twisted together and curled, or relatively loosely twisted together and straight, said highly twisted sections of the conventional slub yarn forming the tightly twisted and curled tufts, whereas the relatively untwisted sections of the conventional slub yarn form the lightly twisted and straight tufts whereby the tightly twisted and curled tufts provide a frieze visual effect and the relatively untwisted straight tufts provide a saxony visual effect.

3,985,090
SPORT BOAT

Richard Lynn Rineman, Brighton, Mich., assignor to Harold J. Rineman, Southfield and S. Albert Young, Birmingham, both of Mich., part interest to each

Filed June 5, 1975, Ser. No. 584,124
Int. Cl.² B63H *9/04*
U.S. Cl. 114—39 **27 Claims**



1. In a sailing craft, the improvement comprising in combination a unitary lower section comprising a main hull, an outboard pontoon and an intermediate web and platform portion, a unitary upper section comprising the cover for said main hull, outboard pontoon and intermediate web and platform portion,
- said unitary lower and upper sections being conjoined at their peripheral edges to form a unitary main hull, outboard pontoon and intermediate web and platform structure,
- a single sail and mast for said craft, said mast being fixedly mounted and supported upright upon said main hull substantially medially of its length, said sail being removably and pivotally secured to said mast adjacent the upper end of said mast and depending and extending downwardly upon that side of said mast remote from said outboard pontoon,
- a boom secured to and extending across the lower portion of said sail free of contact with said mast, manually operable sail control means connected to said boom to pivot said sail from said mast upper end, rudder means for said

craft pivotally mounted for rotation upon said main hull at each longitudinal end thereof, and substantially in a plane passed through the longitudinal axis of said main hull,

and manually operable rudder control means on said main hull connected to said rudder means.

3,985,091

ICEBREAKER VESSEL

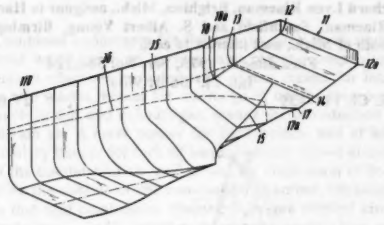
Heinrich Waas, Am Stadtwald 50, 53 Bonn-Bad Godesberg, Germany

Filed Feb. 21, 1975, Ser. No. 551,720

Claims priority, application Germany, July 2, 1974, 2431650; Jan. 29, 1975, 7502495[U]

Int. Cl.² B63B *35/08*

U.S. Cl. 114—40 **10 Claims**



1. An icebreaker vessel for cutting through an unbroken ice sheet comprising a longitudinally extending ship's hull, said ship's hull having a forecastle at its forward end, a stern at its rearward end and an intermediate portion extending longitudinally therebetween, said hull having a top surface and a bottom surface and a mean water-line extending longitudinally about said hull intermediate its top and bottom surfaces, said forecastle has a pontoon-shaped configuration with a pair of parallel vertical side walls extending in the longitudinal direction and a front wall facing in the forward direction of said hull and extending across said hull between said side walls, said front wall having a substantially planar lower portion inclined rearwardly and downwardly from the forward end of the hull at an acute angle with the horizontal, said front wall extending across the full width of the ship's hull, said forecastle including a wedge-shaped portion with a center keel merging into the lower end of said lower portion below the mean water-line, the wedge shaped portion comprising two sections each sloping inwardly and downwardly from the lower end of an opposite one of said vertical side walls to the center keel with the center keel sloping downwardly from the lower end of said lower portion toward the stern of the ship's hull, at least the intermediate portion of said hull extending rearwardly from said forecastle having side walls extending vertically downwardly at least in the range from the water-line to a level located below the lower surface of the ice sheet to be broken, and at least the bottom of said hull adjacent to said forecastle and extending between the vertically extending side walls of said intermediate portion having a V-shaped configuration forming a center keel aligned with the center keel of the wedge-shaped portion of said forecastle, with the center keel of said intermediate portion connected directly to and extending downwardly from the lower end of the center keel of said forecastle toward the stern of the ship's hull.

3,985,092

SAILBOAT TRAVELER APPARATUS

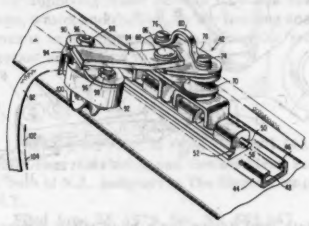
Samuel Robbins, Santurce, P.R., assignor to Mark L. Robbins, Fullerton, Calif.

Continuation of Ser. No. 460,267, April 11, 1974, Pat. No. 3,875,889. This application Mar. 28, 1975, Ser. No. 563,290

The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.

Int. Cl.² B63H *9/10*

U.S. Cl. 114—204 **3 Claims**



1. A traveler assembly for positioning and controlling a sail on a sailboat and adapted to be slidably mounted on an elongated generally rectangular open-topped track having a pair of inwardly directed flanges formed one along each top edge thereof with the flanges being spaced from one another to define an open slot extending the length of the track, said traveler comprising, in combination, an elongated slider block having a generally rectangular base portion adapted to be slidably received in the hollow interior of said track and extending laterally beneath said flanges and an upwardly projecting portion adapted to extend through the open slot between said flanges, a fairlead assembly including a frame, hinge means pivotally supporting said frame on said upwardly projecting portion of said slider block for limited pivotal movement about an axis parallel to and spaced closely adjacent the track, a pair of fairlead sheaves mounted on said frame for rotation about generally parallel upwardly extending axes, and guide means for retaining a control line between said fairlead sheaves.

3,985,093

CHAIN-WIRE ROPE ANCHORING SYSTEMS AND ANCHORING SYSTEMS AND CONNECTORS THEREFOR

Brian L. Eidem, Cerritos, Calif., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Apr. 30, 1975, Ser. No. 572,891

Int. Cl.² B63B *21/50*

U.S. Cl. 114—206 R **15 Claims**

1. In an anchoring system for anchoring a floating structure, the system being of the type comprising an anchor, an anchor chain connected to the anchor, a fairlead mounted on the floating structure to be anchored, a windlass mounted above the fairlead, a chain locker disposed to receive chain from the windlass, a wire rope and a winch for winding the wire rope, the windlass including a combination wheel having an inner groove dimensioned to accommodate the wire rope, an outer groove dimensioned to accommodate the anchor chain, and peripheral flanges spaced apart by a distance larger than the transverse dimension of the anchor chain, the combination of

a connector interconnecting the anchor chain and the wire rope and including at least one support link comprising

a support body having a circular periphery which is concentric with the longitudinal axis of the connector and is of curviform radial cross-section,

a first eye rigidly carried by said support body at one end thereof,

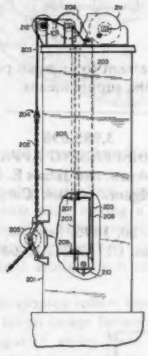
a wire rope socket secured to the wire rope and having an eye extending through said first eye,

a second eye rigidly carried by said support body at the other end thereof, and

means interconnecting the anchor chain and said second eye;

the diameter of said support body being greater than the space between the peripheral flanges of the combination wheel of the windlass, whereby, as said connection traverses the combination wheel, the periphery of said support body engages the peripheral flanges of the combination wheel in free pivotal fashion without requiring that the support link be specially oriented with respect to the combination wheel,

the combination of the wire rope, said connector, and the anchor chain being capable of being hauled in via the combination wheel until the wire rope is wound on the winch without disconnecting the wire rope hauling line from the anchor chain.



15. In a mooring system for a floating structure, said system being of the type having a mooring line including a wire rope, a chain and a connector for joining the wire rope to the chain, the connector being significantly larger than the wire rope, a winch for winding the wire rope, a chain locker having a bottom wall, a fairlead mounted on the exterior of the floating structure, and a windlass mounted above the fairlead, the improvement comprising

means defining an opening in said bottom wall of said chain locker, said opening being larger than said wire rope and smaller than said connector; and

a sheave rotatably mounted adjacent said opening and outside of said chain locker,

said mooring line following a path sequentially defined by said fairlead, said windlass, said chain locker, said sheave and said winch with said connector being stopped at said opening.

3,985,094

SERIES WATERJET PROPULSION PUMPS FOR MARINE VEHICLES

John G. Stricker, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 20, 1976, Ser. No. 659,820

Int. Cl.² B63H *11/08*

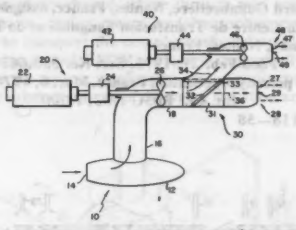
U.S. Cl. 115—14 **5 Claims**

1. A multiple-unit waterjet propulsion system for marine vehicles comprising:

a first waterjet propulsion pump having a water intake flow and a exit flow;

a diverter valve, having a first and a second outlet, attached to the exit flow end of said first pump;

a first thrust nozzle for receiving the exit flow from the first outlet of said diverter valve;



a series-connected waterjet propulsion pump connected to the second outlet of said diverter valve for receiving the exit flow from said first waterjet propulsion pump; and

a second thrust nozzle connected to receive the flow output from said first pump through said diverter valve when augmented thrust is desired.

3,985,095

GEAR SHIFT INDICATOR

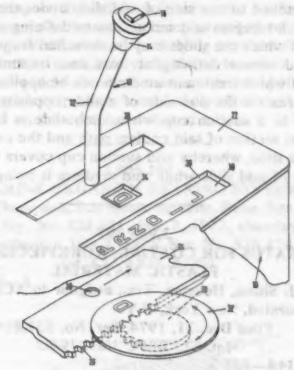
Charles Alexander Nurse, Houghton Regis, England, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 10, 1975, Ser. No. 639,252

Claims priority, application United Kingdom, Jan. 9, 1975, 906/75

Int. Cl.² G09F *9/00*

U.S. Cl. 116—124 M **8 Claims**



1. A gear shift indicator for a motor vehicle comprising a housing mountable within said motor vehicle and with a surface portion having an elongated slot and, adjacent said slot, a window formed therein; a gear lever pivotally mounted within said housing for movement in and along said slot into a number of predetermined positions relative to said slot; a movable indicator member located within said housing adjacent said surface portion, said indicator member carrying discrete legible characters thereon, each of which corresponds to a respective one of said predetermined positions; and a movable member coupled between said gear lever and said movable indicator member to form a movement-increasing arrangement having a ratio of movement between the characters on the movable indicator member and the gear lever of more than 1 to 1, the spacing of the characters on said indica-

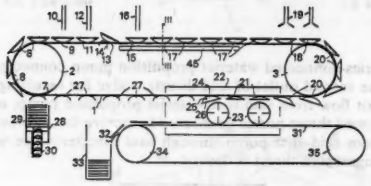
tor member being such that, when the gear lever is in each of said predetermined positions, the corresponding character is visible through said window.

3,985,096

APPARATUS FOR COLORING SLIDES

Jean Gerard Guimbretiere, Nantes, France, assignor to Association du Centre de Transfusion Sanguine et de Dessiccation du Plasma, Nantes, France

Filed Feb. 27, 1975, Ser. No. 553,663
Claims priority, application France, Mar. 6, 1974, 74.08242
Int. Cl.[2] B05C *1/02, 13/00*
U.S. Cl. 118—58 **11 Claims**



1. Apparatus for applying treatment medium to slides, such as slides carrying blood smears, comprising a plurality of suction cups, each cup being approximately the size of the viewing area on said slide, conveying means supporting said cups and adapted to convey the suction cups in an endless path including a horizontal section, means defining a loading station at which smear slides may be attached one by one to the suction cups by being pressed thereto, said suction cup being attached to one side of said slide under the area of the slide which receives said smear, means defining an unloading station at which the slides may be detached from the suction cups, and means defining at least one treatment medium station at which treatment medium can be applied to a smear in said area on the one side of a slide opposite to the side attached to a suction cup when such slide is located on a horizontal section of said endless path and the cup is located under the slide, whereby said suction cup covers and protects said area of said slide while said medium is being applied.

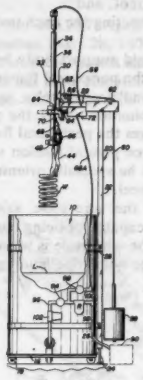
3,985,097

APPARATUS FOR COATING WORKPIECES WITH A PLASTIC MATERIAL

Willard J. Sitton, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 31, 1974, Ser. No. 537,815
Int. Cl.[2] B05C *3/05, 19/02*
U.S. Cl. 118—425 **5 Claims**

1. Apparatus for coating workpieces with a fluidized plastic material comprising a tank having a fluidized plastic coating material therein for coating workpieces therein which have been preheated to a predetermined high temperature, a fixed support frame extending over the tank, a vertically movable support mounted on the fixed support frame for movement between raised and lowered positions, means on the lower end of the movable support to releaseably suspend a workpiece thereon, a pneumatic vibrator secured to the lower end of said vertically movable support for vibrating said support and workpiece thereon when said workpiece is held in a suspended position within the fluidized plastic coating material within the tank, and means to supply air to said vibrator including an air valve positioned on the fixed support frame adjacent the movable support and having means in contact with the movable support in an upper position for maintaining the air valve in a closed position, the downward movement of said movable support from the upper position to a lower position releasing



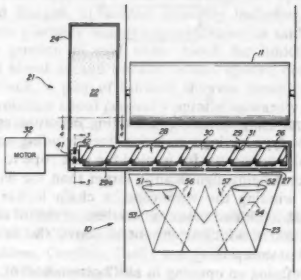
the air valve for movement to an open position to supply air to the vibrator from the supply means.

3,985,098

TONER DISPENSING APPARATUS

Charles E. Myers, Woburn, and James E. Genthe, Chelmsford, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Jan. 20, 1975, Ser. No. 542,319
Int. Cl.[2] G03G *15/08*
U.S. Cl. 118—637 **20 Claims**



1. Toner dispensing apparatus for electrophotographic copiers comprising:

a. an elongated housing, said housing having aperture means extending through a lower wall thereof;

b. toner supply means for holding a supply of toner to be dispensed;

c. elongated auger means, one end of said auger means cooperating with and being positioned to receive toner from said toner supply means and the other end of said auger means being positioned within said elongated housing, said auger means having a resilient surface and a helical channel formed therearound within said resilient surface; and,

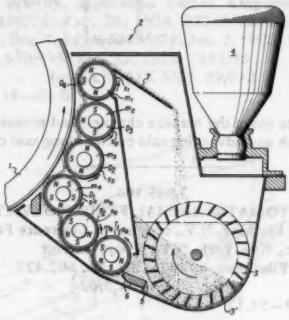
d. means for rotating said auger means, the rotation thereof causing toner positioned within said helical channel to be transferred from said one end of said auger means toward said other end thereof whereby toner will be dispensed through said aperture means as said helical channel moves thereacross.

3,985,099

MAGNETIC BRUSH DEVELOPING DEVICE

Toshio Nagashima; Mitsuharu Nakaguchi; Takuzo Tsukamoto; Ryuzo Okada; Hidetoshi Kito, and Kenichi Handa, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 13, 1975, Ser. No. 576,997
Claims priority, application Japan, May 13, 1974, 49-52303
Int. Cl.² B05B 5/02; G03G 13/09, 15/09
U.S. Cl. 118—637 **3 Claims**



1. In a magnetic brush developing device, the improvements comprising;

a plurality of developing rollers consisting of cylindrical stationary magnets each having a developing magnetic pole and disposed in facing relation to the surface of latent image forming member, and cylindrical sleeves rotatably mounted around each of said stationary magnets,

said plurality of developing rollers being arranged along the surface of said latent image forming member so that the developing magnetic poles have alternately opposite polarities, whereby delivery and receipt of the developing agent between the adjacent developing rollers are effected between the developing magnetic poles of adjacent developing rollers;

each said cylindrical stationary magnet having, in addition to its developing magnetic pole, a pair of further magnetic poles disposed on the opposite sides of their associated developing magnetic pole, at least some of said cylindrical stationary magnets having only their developing magnetic pole and pair of further magnetic poles disposed thereon, said further magnetic poles having polarities opposite to that of their associated magnetic pole, at least some of said further magnetic poles of each cylindrical stationary magnet directly facing adjacent further magnetic poles of opposite polarity disposed on adjacent cylindrical stationary magnets such that the said some further magnetic poles contribute neither to the development of said latent image nor to the transportation of said latent image while at the same time the leakage flux from the developing magnetic poles associated with said some further magnetic poles is maximized.

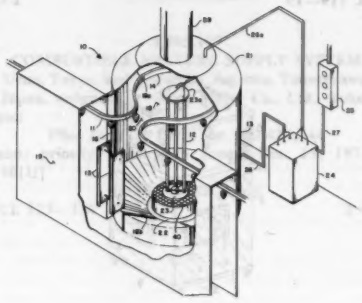
3,985,100

APPARATUS FOR IRRADIATING COMPOSITIONS

Emery P. Miller, Indianapolis, Ind., assignor to Ransburg Electro-Coating Corporation, Indianapolis, Ind.

Continuation of Ser. No. 375,662, July 2, 1973, abandoned, which is a division of Ser. No. 197,366, Nov. 10, 1971, abandoned. This application Apr. 12, 1974, Ser. No. 460,438
Int. Cl.² B05D 3/06; H01J 37/00
U.S. Cl. 118—643 **4 Claims**

1. Apparatus for treating the surface of a complexly-shaped article of EPDM material, comprising means to remove contaminates from the EPDM surface of the complexly-shaped articles; means to dry the EPDM surface and to remove any residue remaining after removal of the contamination; means to apply to the EPDM surface a solution of benzophenone and solvent so as to provide a coating of benzophenone on the complexly-shaped EPDM surface; a source of substantially radially ultraviolet light diverging radiation; means to transport the complexly-shaped article through said contaminate removal means, drying means and benzophenone-applying means and to transport the complexly-shaped article with its benzophenone-coated EPDM surface in a generally arcuate path around the source; a reflective enclosure for said source to intercept substantially all of diverging radiation and configured to direct the reflected radiation at the source article, said enclosure including a reflective floor and a reflective roof and further including means to feed an inert purge gas through the bottom thereof and an exhaust stack disposed at the top thereof, said enclosure further including a barrier means to confine said radiation to the enclosure and to enclose the means to transport the article as it enters the enclosure, said means to transport the article being arranged to move the article in a generally arcuate path lying between the source and the reflective enclosure surface and to rotate the complexly-shaped article about an axis as it is transported along the arcuate path to irradiate substantially all of the benzophenone carried on the complexly-shaped article.

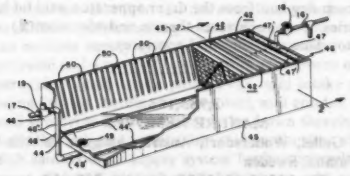


3,985,101

MARINE ORGANISM REARING SYSTEM

Jerome C. Thompson, Star Route Sutcliffe, Reno, Nev. 89510

Division of Ser. No. 431,451, Jan. 7, 1973, abandoned. This application July 2, 1975, Ser. No. 578,434
Int. Cl.² A01K 61/00
U.S. Cl. 119—2 **3 Claims**



1. A trough for rearing aquadic cultures of rearing crustanceans, comprising: in depth a tank having a bottom wall and side walls, in an input conduit being disposed in the upper portion of one of the terminal ends of said conduit and a discharge being disposed of the end opposite said input conduit in the lower portion of said tank: a plurality of substantially upstanding transversely disposed trays removably mounted in said tanks, said trays having means for retaining said crustaceans in a predetermined density over said trays,

said means for controlling distribution of said crustaceans includes a rectangular frame a plurality of rectilinear transverse dividers mounted to said frame and to each other, and screen disposed on each side of said trays.

3,985,102

DRYER APPARATUS FOR HAIRS OF PET DOGS

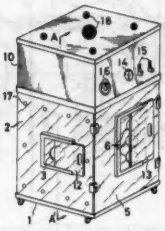
Shoji Yonezawa, 22-8, Hayamiya 1 chome, Nerima, Tokyo, Japan

Filed Oct. 6, 1975, Ser. No. 619,934

Claims priority, application Japan, Oct. 15, 1974, 49-124412

Int. Cl.² A01K *13/00*

U.S. Cl. 119—19 **1 Claim**



1. Dryer apparatus for hairs of pet dogs consisting of a transparent box (1) having a door at its front side, and a lid member (4) therabove provided with dryer apparatus including a heater, fan and motor, said dryer apparatus further comprising:

A. a plurality of vertically spaced aligned apertures (6) in the central portion of the door, for different heights of dogs so that the nose of the dog can slightly project outwardly of one of said apertures, a cover plate (13) slidably mounted on the door to cover said door openings and adjustably open them; there being an opening (3) in each side wall of the box large enough to receive the hands of a dog attendant; a cover plate (12) slidably mounted on each side wall covering the side wall openings and adapted to open them;

B. a transverse upper plate (11*a*) within and suspended from the lid (10) to which the dryer apparatus (4) consisting of a heater (7), fan (8) and motor (9) are suspended; a cylindrical partition plate (11*c*) inside of and mounted on the lid for uniformly directing heated air downwardly; and a wire net (11*b*) at the bottom of the lid to keep dog hair from the dryer apparatus; said lid having a series of vent apertures therein and wire nets (8) on the lid top face covering said apertures.

3,985,103

MANURE REMOVER

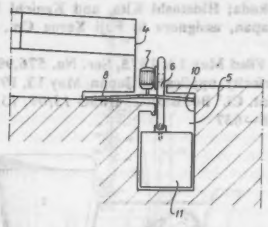
Herbert Gallei, Wollersdorf, Austria, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Mar. 17, 1975, Ser. No. 559,057

Int. Cl.² A01J *1/00*

U.S. Cl. 119—28 **4 Claims**

1. In a manure remover for stables having a plurality of animal stalls arranged along a manure channel, which stalls have a manure area adjacent the manure channel, the improvement which comprises a substantially flat circular brush having generally horizontally directed bristles, said brush being rotatable about a generally vertical axis and mounted on a carrier arranged to be advanced along the manure channel, said brush extending over the manure channel and being arranged to sweep the manure areas of the stalls as it rotates



and advances along the manure channel, and means for rotating said brush and advancing said carrier along said channel.

3,985,104

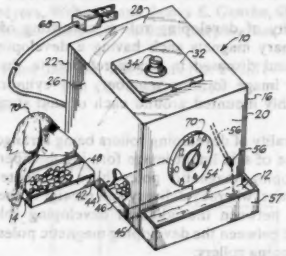
AUTOMATIC ANIMAL FEEDER DEVICE

Zvi Klemer, Flushing, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Aug. 6, 1975, Ser. No. 602,427

Int. Cl.² A01K *5/02*

U.S. Cl. 119—51.12 **3 Claims**



1. An automatic animal feeder device, which comprises:

a. a housing having a base, a top with an opening therethrough, a plurality of upwardly extending walls, one said wall having a second hold therethrough, another said wall having a pair of elongated slotted apertures therethrough, and an intermediate slanted wall disposed within said housing for forming upper and lower chambers within said housing, said intermediate wall having a first hole therethrough;

b. a open top water receptacle mounted onto an exterior surface of one sidewall below said second hole;

c. a tube extending through said first and said second holes, said tube transferring water from said upper compartment to said open top receptacle, said water formed from ice melting within said upper compartment;

d. a pair of drawer guide assemblies mounted on an upper surface of said base within said lower compartment, each said guide assembly aligned with one said aperture;

e. a drawer slideably contained in each said guide assembly through each said aperture, each said drawer adapted to receive animal food therein;

f. a spring mounted between each said drawer and an inner surface of rear wall;

g. a solenoid switching member having a downwardly extending rod mounted on said inside surface of said rear wall above each said drawer;

h. a J-shaped member affixed to each said rod, each said J-shaped member engaging and retaining each said drawer within said lower compartment;

i. a timer unit electrically communicating with each said solenoid member to independently activate each said solenoid member; and

j. a cover fitting over said opening in said top.

3,985,105

APPARATUS FOR DISPENSING ANIMAL FOODSTUFFS

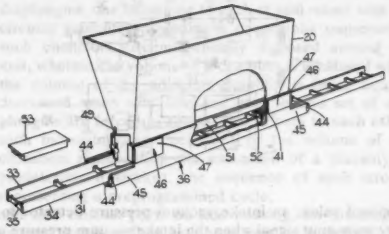
John Francis Smith, Alcester, England, assignor to Arrow Vale Egg Producers Limited, England

Filed Mar. 5, 1975, Ser. No. 555,539

Claims priority, application United Kingdom, Mar. 29, 1974, 14189/74; Aug. 29, 1974, 37740/74; Oct. 23, 1974, 45941/74; Dec. 7, 1974, 53035/74; Jan. 2, 1975, 156/75; Feb. 11, 1975, 5705/75; Feb. 22, 1975, 7553/75

Int. Cl.² A01K *5/02, 39/012*

U.S. Cl. 119—52 B 22 Claims



1. Apparatus for dispensing animal foodstuffs comprising a foodstuffs receiver of elongate form for stationary positioning in a trough, equal in length to the length of said trough into which foodstuffs are to be dispensed, and, a dispensing head having an outlet coupled to the foodstuffs supply and movably engaged with the receiver for movement in the trough along the length of the receiver, the elongate receiver including elongate parallel side walls interconnected by transversely extending longitudinally spaced partition walls, and the receiver passing through the head below a foodstuffs outlet whereby foodstuffs can pass from the supply through the head and into that portion of the receiver within the head, the outlet being partially obstructed by a baffle means secured with the head and which extend transversely and downwardly towards the receiver, the baffle means directing the flow of foodstuffs into the receiver.

3,985,106

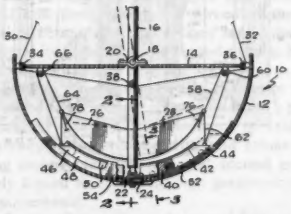
SAILBOAT STABILIZING SYSTEM

Abraham D. Ross, 501 Van Ness Ave., Bldg. B, Torrance, Calif. 90501

Filed Feb. 25, 1975, Ser. No. 552,990

Int. Cl.² B63B *15/00*

U.S. Cl. 114—91 9 Claims



1. A sailboat having a sailboat stabilizing system comprising:

a sailboat hull;

a mast pivotally mounted on a pivot point with respect to said hull, a partially circular arcuate track in said hull having its center point substantially at said pivot point;

a counter-weight secured to said mast below said pivot point to urge said mast forward in upright position;

said mast engaging in said track so that said track provides support to said mast from said hull;

a movable non-resilient weight positioned to move on and be supported on said mast-supporting track, said movable weight being connected to said mast so that, as said mast rotates about its pivot, said movable weight is moved in said hull.

3,985,107

COMBUSTIBLE MIXTURE SUPPLY SYSTEM

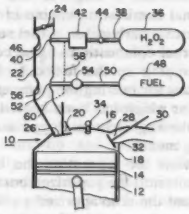
Zene Ueno, Tokyo, and Tadahiko Nagaoka, Tokorozawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 14, 1973, Ser. No. 424,744

Claims priority, application Japan, Dec. 15, 1972, 47-144140[U]

Int. Cl.² F02B *43/08*

U.S. Cl. 123—1 A 2 Claims



1. A combination of an engine having a combustion chamber, an intake passageway providing communication between said combustion chamber and the outside atmosphere, and a source of fuel communicating with said combustion chamber, with an oxidizer supply system comprising a source of hydrogen peroxide and a conduit leading from said source of hydrogen peroxide to said intake passageway, said intake passageway being formed therein with a venturi, said conduit opening into said venturi to cause oxidizer to be drawn thereinto when air passes through said venturi into said combustion chamber, in which said oxidizer supply system further comprises a decomposer disposed in said conduit between said source of hydrogen peroxide and said intake passageway operative to decompose hydrogen perioxide passing therethrough in which said decomposer comprises a catalyst, in which said venturi is formed in said intake passageway upstream of a section of said intake passageway with which said source of fuel communicates, in which said oxidizer supply system further comprises a branch passageway communicating with said conduit downstream of said decomposer and opening into said intake passageway downstream of said section.

3,985,108
FUEL SEPARATING SYSTEM FOR STARTING AN INTERNAL COMBUSTION ENGINE

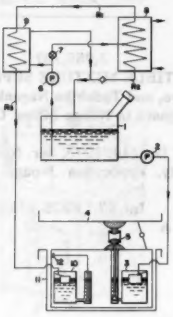
Ryohei Matsumoto, 1618, Wakabayashi, Kamimura, Hamana, Shizuoka; Kazuhide Suganuma, 88, Nakayama-cho, Hamamatsu, Shizuoka, and Satoru Takahashi, 600-258, Ubumi, Yuto-cho, Hamana, Shizuoka, all of Japan

Filed July 25, 1974, Ser. No. 491,926

Claims priority, application Japan, July 28, 1973, 48-85132; Jan. 31, 1974, 49-13526

Int. Cl.² F02B *43/08*

U.S. Cl. 123—3 **14 Claims**



1. In an internal combustion engine in which fuel in a fuel tank is sucked into a carburetor, a fuel separating system for starting the internal combustion engine comprising:

means for pumping up the fuel out of the fuel tank and heating means for heating the pumped up fuel, wherein a cooling water which has been heated as the result of the cooling of the engine is employed as a heating source of said heating means;

separating means for separating the heated fuel by said heating means into the vaporized portion of a low-boiling point fuel and the nonvaporized portion;

cooling means connected to the pump means for flowing fuel from the pump means to the cooling means and absorbing heat in the fuel for cooling and condensing the vaporized portion of the low-boiling point fuel;

storing means for storing the condensed low-boiling point fuel; and

nozzle means for effecting the low-boiling point fuel stored in said storing means into a starter passage of the carburetor out of said storing means.

3,985,109
BREAKERLESS IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Tetsuya Kondo, Susono, and Takeshi Watanabe, Fuji, both of Japan, assignors to Kokusan Denki Co., Ltd., Numazu, Japan

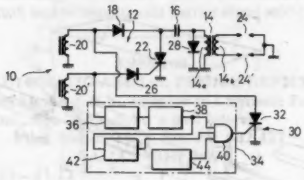
Filed Jan. 27, 1975, Ser. No. 544,173

Claims priority, application Japan, Jan. 30, 1974, 49-12349

Int. Cl.² F02P *5/04, 1/00*

U.S. Cl. 123—8.09 **7 Claims**

1. A breakerless ignition system for an internal combustion engine comprising an ignition power supply, a capacitance connected to be charged from said ignition power supply, an ignition coil having a primary winding connected to said capacitance and a secondary winding connected to at least one spark plug, a first semiconductor switching means connected to discharge said capacitance through said primary winding of said ignition coil when said first semiconductor switching means is turned on, and an ignition signal source to trigger said first semiconductor switching means to be turned on, said ignition system further comprising an ignition inhibiting means including a second semiconductor switching means connected to prevent said ignition power from being applied to said capacitance; and a control circuit including flip-flop means operatively associated with said ignition signal source, a speed detector to produce an output signal when the speed of the internal combustion engine becomes less than a predetermined value, an intake vacuum pressure detector to produce an output signal when the intake vacuum pressure of the engine is greater than a predetermined value, and means to turn on said second semiconductor switching means when all of the outputs from said flip-flop means, said speed detector and said intake vacuum pressure detector are received.



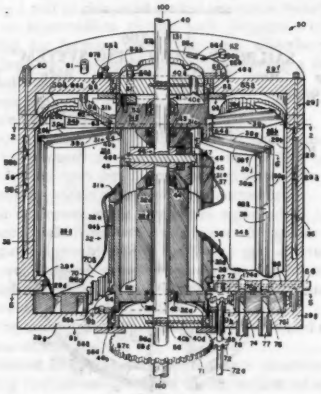
3,985,110
TWO-ROTOR ENGINE

George J. Doundoulakis, North Bellmore, N.Y., assignor to William J. Casey, Roslyn and Helias Doundoulakis, Baldwin, both of N.Y., part interest to each

Filed Jan. 20, 1975, Ser. No. 542,250

Int. Cl.² F02B *53/00*

U.S. Cl. 123—8.47 **13 Claims**



1. A rotary engine converting energy into work comprising:

a stationary housing including internally a first surface of

revolution disposed about an imaginary line to be referred to as the axis;

a first rotor including a second surface of revolution about the axis;

a second rotor including a third surface of revolution about the axis;

a cavity of revolution about the axis, being formed by the aforesaid three surfaces of revolution;

a first set of cavity diaphragms rigidly attached to said first rotor, and extending across and dividing said cavity of revolution into a number of substantially equal volume subcavities;

a second set of cavity diaphragms rigidly attached to said second rotor and extending across, said cavity of revolution, said second set of diaphragms being interleaved with said first set of diaphragms whereby each of the aforesaid subcavities is further divided into two chambers, each chamber thus being bounded by a portion of each of the aforesaid three surfaces of revolution and two cavity diaphragms, one belonging to each of said rotors with the circular geometry providing a continuous sequence of such chambers circumferentially disposed around the axis, wherein the volume of a chamber is increased while the volume of the adjacent chamber is being equally decreased when said first and said second set of diaphragms are forced to rotate with respect to each other, such increasing and decreasing of the volume of the chambers representing the execution of a plurality of predetermined strokes, the sequence of such strokes representing a preprogrammed cycle;

intake and exhaust ports on said housing, for intaking an energy containing fluid and for exhausting such fluid after some of the energy has been converted to torque;

stroke programming means comprising a plate rotating in sliding contact with one of the bases of said housing, their relative rotation establishing and interrupting coincidence of slots with holes, positioned at predetermined radial and azimouthal positions on the rotating plate and the adjacent base of said housing, for establishing communiction passages between the aforesaid chambers and said intake and exhaust ports on said housing, for preprogramming the strokes to be performed by each of the aforesaid chambers;

said stroke programming means also being operative in establishing the timing of intaking energy cyclically into the chambers while in a predetermined phase of a predetermined stroke wherein such energy is alternately being used for exerting pressure onto the diaphragms of such chambers for alternately forcing said first set of diaphragms and therefore its associated said first rotor in a forward direction and said second set of diaphragms and therefore its associated said second rotor in the reverse direction, causing the volume of such chambers to expand; said stroke programming means also being operative in establishing the timing for exhausting the remains of the intaken fluid; means for limiting the rotation of said second rotor whereby the work done by the energy is converted in a predetermined forward rotational displacement of said first rotor; and wherein alternately, the intaken energy is also being used for exerting pressure causing said first set of diaphragms and therefore its associated said first rotor to be forced in the reverse rotational direction, and said second set of diaphragms and therefore its associated said second rotor to be forced in the forward rotational direction;

means for limiting the rotation of said first rotor whereby the work done by the energy is converted into a predetermined forward rotational displacement of said second rotor, thereby in accordance with said stroke preprogramming means said first and said second rotors are alternately forced to rotate through predetermined forward displacements;

and means for transfering torque from said first and/or said second rotor to at least one output shaft.

3,985,111

ARTICLE FOR DEFINING AN AUXILIARY COMPARTMENT FOR AN ENGINE COMBUSTION CHAMBER

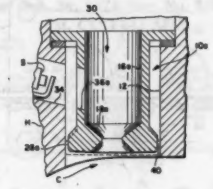
Michael C. Turkish, Lyndhurst, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 17, 1973, Ser. No. 425,588

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² F02B *19/10*

U.S. Cl. 123—325 T **26 Claims**



1. An article for use in defining an auxiliary compartment of the combustion chamber of an internal combustion engine, said article comprising:

a. a tubular central heat receiving portion with one end open and the opposite end cupped;

b. a mounting portion disposed adjacent said open end and extending in a direction generally outwardly from the wall of said central portion;

c. at least one aperture formed in said cupped end for communicating the interior region of said central portion with the engine combustion chamber; and

d. a heat output portion adjacent said cupped end and extending in a direction generally outwardly from the outer periphery of said central portion, said heat output portion having predetermined dimensions such that, upon attachment of said article in an engine combustion chamber by said mounting portion, said article expands during initial engine warm-up and said heat output portion contacts, initially spaced adjacent walls of the engine combustion chamber at a predetermined temperature with said central portion spaced from said adjacent chamber walls and said heat output portion remains in such contact at temperatures greater than said predetermined value for conducting heat only from the heat output portion of the cupped end of said article to the walls of the combustion chamber.

3,985,112

METHODS AND APPARATUS FOR IMPROVING FUEL VAPORIZATION IN INTERNAL COMBUSTION ENGINES

Wilmer C. Jordan, 3915 W. Wrightwood Ave., Chicago, Ill. 60647

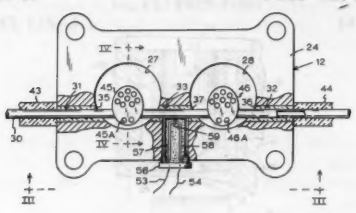
Continuation of Ser. No. 378,836, July 13, 1973, abandoned. This application Sept. 22, 1975, Ser. No. 615,385

Int. Cl.² F02M *31/00*

U.S. Cl. 123—122 H **9 Claims**

1. In apparatus for improving the performance of an internal combustion engine including air-fuel mixing means, flow path means for flow of mixed air and fuel from said mixing means for combustion in said engine and throttle valve means for controlling said flow of mixed air and fuel, heater means disposed in said flow path means and having an internal fluid flow passage and an external surface for radiation of heat into the fuel, and fluid supply means for supplying a high temperature fluid to flow through said internal fluid flow passage to heat said external surface to a high temperature and to cause radiation of radiant heat from said external surface into the fuel for vaporization thereof, said heater means having a solid imperforate wall preventing flow of said high temperature fluid from said internal fluid flow passage into said mixed air

and fuel flow path means, said high temperature fluid being supplied to continuously maintain said external surface at said high temperature during normal operation of the engine after warm-up thereof, and said fluid supply means being arranged to maintain the temperature of said external surface at approximately a predetermined high temperature through changes in the rate of flow of said high temperature fluid to said heater means, the rate of flow of said high temperature fluid being increased when the amount of heat radiated from



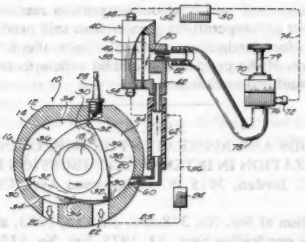
said heater means is increased and being decreased when the amount of heat radiated from said heater means is decreased, said fluid supply means including control valve means for controlling flow of said high temperature fluid, temperature sensing means for responding to a temperature corresponding to the temperature of said external surface of said heater means, and control means coupled to said temperature sensing means and to said control valve means to control said control valve means from said temperature sensing means.

3,985,113

PRIMER SYSTEM FOR ROTARY COMBUSTION ENGINE

Chester G. Du Bois, Zion, and Howard M. Pollari, Libertyville, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 18, 1974, Ser. No. 533,970
Int. Cl.² F02M *1/16*
U.S. Cl. 123—187.5 R **7 Claims**



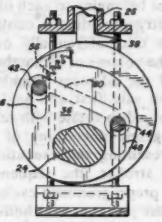
1. A rotary internal combustion engine comprising an engine block defining a rotor cavity having an internal peripheral wall, a rotor located for rotation in said cavity and including a plurality of apex portions sealingly engaging said peripheral wall, said rotor cooperating with said peripheral wall during rotation of said rotor relative to said peripheral wall to form a plurality of substantially sealed rotating chambers which cyclically vary in volume to alternately undergo fuel intake and expansion when the volume of said chambers is increasing and to alternately undergo compression and exhaust when the volume of said chambers is decreasing, a main fuel inlet communicating with said cavity and communicating successively with each of said chambers to permit intake of fuel for subsequent compression and ignition during engine operation, a port located in said engine block and spaced from said main fuel inlet to communicate successively with said chambers while fuel intake and compression are cyclically occurring in said chambers, a pressure operated fuel pump including a pumping chamber communicating with said inlet and with a source of fuel and a pulsing pressure chamber communicating with said port, and primer means communicating with said port and with a source of fuel and operable for selectively pumping a quantity of primer fuel from the fuel source into said rotor cavity through said port.

3,985,114

APPARATUS FOR SHOCK MOUNTING OF PISTON RODS IN INTERNAL COMBUSTION ENGINES AND THE LIKE

Tony E. Vallejos, Signal Hill, Calif., assignor to Alto Automotive, Inc., Deerfield, Ill.

Filed May 19, 1975, Ser. No. 578,805
Int. Cl.² F02B *75/32*
U.S. Cl. 123—197 R **24 Claims**



1. In an engine having piston means reciprocable in cylinder chamber means; a crankshaft adapted for power-conveying rotation, and power-transmitting connection means between said piston means and the crankshaft, the improvement comprising:

a bearing member, defining a curved periphery, carried on said crankshaft for eccentric rotation thereabout as the crankshaft rotates, the periphery of said bearing member being positioned to contact said connection means in power-transmitting, sliding relationship, and means permitting displacement of said bearing member by said connection means relative to said crankshaft, to absorb shock generated in the chamber means, said bearing member being adapted for return to its pre-displacement position after absorbing of said shock.

3,985,115

HOT AIR FURNACE

Dan B. McVickar, and Adolf Wolf, both of Holland, Mich., assignors to Lear Siegler, Inc., Holland, Mich.

Continuation of Ser. No. 425,154, Dec. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 202,126, Nov. 26, 1971, Pat. No. 3,794,014. This application Feb. 25, 1975, Ser. No. 552,945
The portion of the term of this patent subsequent to Feb. 12, 1991, has been disclaimed.
Int. Cl.² F24H *3/10*
U.S. Cl. 126—110 AA **12 Claims**

1. A hot air furnace comprising:

a combustion chamber having a continuous side wall and closed ends;

a flue chamber wall surrounding and spaced from said combustion chamber side wall and closed at one end;

a closure member for the opposite end of said flue chamber wall including a flue pipe extending therefrom and communicating with the flue chamber defined in part by the space between said combustion chamber wall and said flue chamber wall;

an air chamber wall surrounding and spaced from said flue chamber wall to define an air chamber therebetween; and

first and second sets of U-shaped fin members, one on each side of said flue chamber wall, each set including a plurality of separate elongated U-shaped fin members each having base portions positioned on one side of said flue chamber wall to be aligned directly opposite a base portion of a fin member of the other set of fin members positioned on the other side of said flue chamber wall and opposed and aligned fin members seam welded to said flue chamber wall, said fin members having a pair of legs extending from said base portions a substantial distance to provide fins in at least portions of said flue chamber

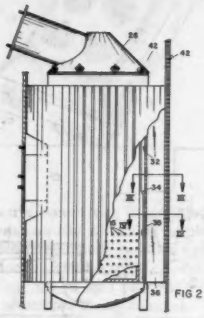


FIG 2

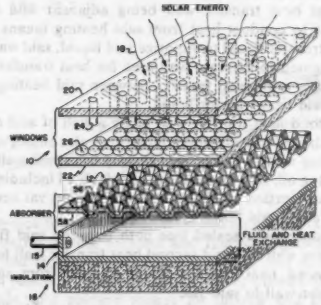
and in at least portions of said air chamber; said combustion chamber wall including a plurality of apertures formed therethrough near one end and wherein each base portion of said fin members of said first set extends substantially along the length of said flue chamber wall, said fins of said first set formed by said pair of legs along only portions of the length of said flue chamber wall remote from said apertures in said combustion chamber wall extending from said flue chamber wall a significant distance toward said combustion chamber, and said legs of each fin of said first set of fins being stub portions adjacent the apertured end of said combustion chamber.

3,985,116

HIGH EFFICIENCY SOLAR PANEL

Narinder S. Kapany, Woodside, Calif., assignor to Kaptron, Inc., Palo Alto, Calif.

Filed Apr. 22, 1974, Ser. No. 462,857
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **7 Claims**



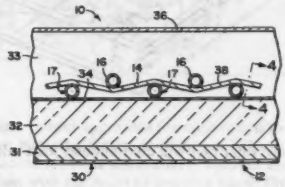
1. A panel for converting incident light into heat comprising a heat absorbing portion and a window portion interposed between the indicent light and the heat absorbing portion, wherein the window portion includes a pair of transparent sheets, perpendicular supports for keeping the sheets spaced apart, the supports being made of light transmitting material arranged to transmit the incident light striking the window within a predetermined angle of acceptance to the heat absorbing portion by means of multiple, total internal reflections, and means for segmenting the air space between the sheets to prevent heat loss due to convective air currents.

3,985,117

SOLAR SENSOR-HEATER

Leroy H. Sallen, 225 Country Club Drive, Largo, Fla. 33540

Filed Dec. 26, 1974, Ser. No. 536,551
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **6 Claims**



1. A solar sensor and heater means comprising fluid conduit means, fluid inlet means and fluid outlet means both interconnected in fluid communicating relation to said fluid conduit means, whereby fluid is directed to and from said fluid conduit means at substantially spaced apart points thereof, black body means including a heat conductive sheet element having a substantially undulating configuration along at least a portion of its length, adjacent and successively disposed predetermined portions of said fluid conduit means positioned in direct engagement with oppositely disposed surfaces of said sheet element, pump means disposed in fluid regulating relation to fluid within said fluid conduit means and temperature sensing-/signalling means disposed in temperature sensing engagement with said fluid conduit means and in electrically connected actuating relation with said pump means, whereby fluid flow to and from said fluid conduit means is regulated by activation of said pump means dependent upon the sense temperature of the fluid conduit means.

3,985,118

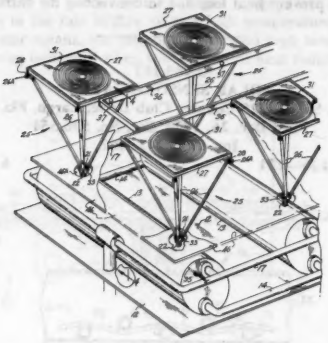
SOLAR FURNACE

Robert F. Bard, 1201 SW. Cardinell Drive, Portland, Oreg. 97201

Filed June 9, 1975, Ser. No. 585,231
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **13 Claims**

1. In a solar furnace, the improvement comprising,
a vessel through which a fluid flow may pass,
a heat conductor associated with said vessel and in heat exchanging relationship with the fluid flow therewithin, said heat conductor having a portion external of the vessel,
a lens focusing solar rays toward said external portion of the heat conductor,
means supporting the lens in spaced relationship to said heat conductor,
control means imparting tracking movement to said lens supporting means, and
said lens supporting means in movable engagement with

said heat conductor permitting movement of the lens about the external portion of the heat conductor whereby



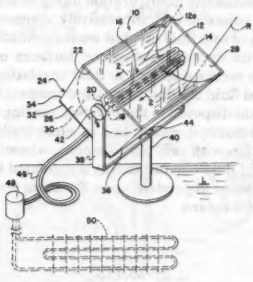
the focused solar rays will continuously heat said conductor.

3,985,119

SOLAR HEAT COLLECTOR

Francis W. Oakes, Jr., 3911 Tiverton Road, Randallstown, Md. 21133

Filed Oct. 1, 1975, Ser. No. 618,346
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **8 Claims**



1. In a collection system for solar energy, having a trough-like reflective collector, means passing along the focal area thereof for conducting fluid to be heated, means for circulating and extracting energy from the fluid heated, and means for orienting the reflective collector, the improvement comprising:

the reflective collector having a parabolic cross-section;

the means for conducting fluid including: a first tube system having a portion thereof passing along the focal line of the reflective collector; and

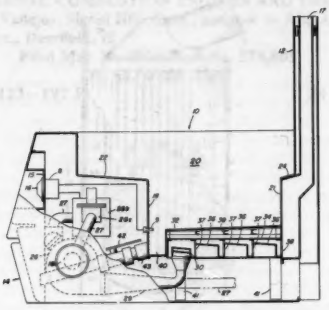
a second tube system, having a portion thereof passing outside the focus of the reflective collector in parallel-spaced relation with said first tube system portion said second tube system portion being in the incoming beam of solar energy and arranged in front of said first tube portion.

3,985,120

DEEP FAT FRYER

Lazaros J. Lazaridis, Lincoln; Edward F. Searight, Harvard, both of Mass., and Paul K. Shefsiek, Farmington, Mich., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Jan. 16, 1975, Ser. No. 541,482
Int. Cl.² A47J 27/17
U.S. Cl. 126—378 **2 Claims**



1. A deep fat fryer comprising:

a jacketed, relatively deep cooking vat adapted to contain and to heat for immersion cooking an edible, thermally decomposable cooking oil which is rapidly decomposed at temperatures substantially above normal cooking temperatures, the internal portions of said vat being free from obstructions and open at its top;

a heat transfer liquid volatile at normal cooking temperatures sealed within a jacket at least partially surrounding said vat, the interior of said jacket being essentially devoid of substances which are not condensible at operating conditions;

heating means;

means defining a heating zone for the heat transfer liquid said means including a first heat transfer wall and a second heat transfer wall,

said first heat transfer wall being adjacent said heating means to conduct heat from said heating means to said heat transfer liquid to vaporize said liquid, said wall being corrugated to increase wall area for heat transfer and to promote rapid heat transfer between said heating means and said heat transfer liquid,

said second heat transfer wall being a wall of said cooking vat adapted to be in direct liquid-to-wall contact with said cooking oil to transfer heat rapidly from said wall to said cooking oil, said second heat transfer wall including an oil heating portion of the bottom wall of said vat across less than all of said bottom wall;

means defining a sealed free path between said first heat transfer wall and said second heat transfer wall to permit vaporized heat transfer liquid to pass from said heat transfer wall to said vat;

a recess at the bottom of said vat adjacent said oil heating portion,

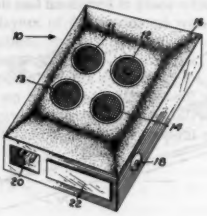
whereby heating said oil causes convection currents to carry contaminants in said oil to said recess; and

means to return condensed heat transfer liquid to said heat transfer wall.

3,985,121
HEART DETECTIVE

Samuel H. Hellenbrand, New York, N.Y., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 20, 1975, Ser. No. 579,103
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2 K 8 Claims



1. A heart detective comprising in combination:

means for simultaneously detecting a plurality of heart sounds, said detecting means includes a plurality of directive microphones and audio channels, each of said microphones coupling one of said plurality of detected heart sounds to an associated audio channel;

means providing a plurality of prerecorded heart sounds, said prerecorded heart sounds are stored on a multitrack magnetic tape in a predetermined synchronism;

means for comparing said detected heart sounds and said prerecorded heart sounds to produce a correlation indication, said comparing means includes a correlation detector providing an amplitude and frequency correlation indication between one of said detected heart sounds and one of said prerecorded heart sounds;

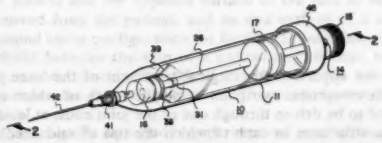
means responsive to the predetermined synchronism to sequentially control the comparison of one of said plurality of detected heart sounds to a corresponding one of said prerecorded heart sounds; and

means coupled to said comparing means for displaying said correlation indication for each of said plurality of heart sounds.

3,985,122
MULTI-PISTON SYRINGE DEVICE

Silas Charles Topham, Orem, Utah, assignor to Medical Development Corporation, Salt Lake City, Utah

Filed June 4, 1975, Ser. No. 583,776
Int. Cl.[2] A61B 5/00
U.S. Cl. 128—2 F 2 Claims

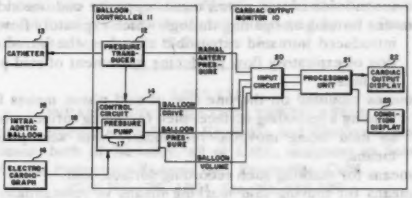


1. A device for mixing chemicals and including, in combination, a barrel having forward and rear contiguous bores of smaller and larger transverse cross-section and meeting at a common junction respectively, respective pistons disposed in said bores, and plunger means for linking said pistons for mutual, corresponding forward travel, said rear piston being in self-adjustment cooperation with said plunger for plunger withdrawal strokes, said barrel including bypass apertures shunting the junction of said forward and rear bores and spaced forwardly of said junction a distance greater than the axial thickness of said forward piston.

3,985,123
METHOD AND MEANS FOR MONITORING CARDIAC OUTPUT

George A. Herzlinger, Belmont; Armando Federico, Needham, and Arthur R. Kantrowitz, Cambridge, all of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed July 17, 1975, Ser. No. 596,907
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2.05 F 23 Claims



1. Cardiac output apparatus for connection to an intra-aortic balloon pumping system including a balloon located in a patient's aorta which is alternatively inflated and deflated in synchronism with the heart to improve blood flow therefrom, said apparatus displaying the quantity of blood flow in the patient's heart in response to a signal representing blood pressure in an artery and including:

A. pressure signal means for transmitting an input pressure signal in response to the blood pressure signal from the system,

B. means for transmitting a balloon deflation signal representing a pressure excursion at the time the balloon is deflated in response to the input pressure signal,

C. means for transmitting a ventricle ejection pressure signal representing the pressure excursion during a ventricle ejection pulse in response to the input pressure signal,

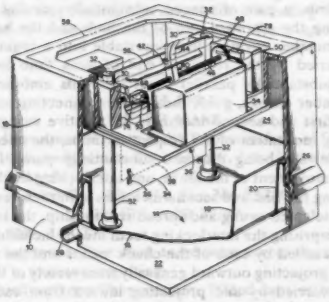
D. means responsive to the balloon deflation pressure and the ventricle ejection pressure signals for transmitting an output signal representing blood flow from the aorta, and

E. means for utilizing the output signal.

3,985,124
SPIROMETER

Steven J. Coleman, Marlboro, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Mar. 26, 1975, Ser. No. 562,302
Int. Cl.[2] A61B 5/08
U.S. Cl. 128—2.08 20 Claims



1. A recording spirometer comprising:

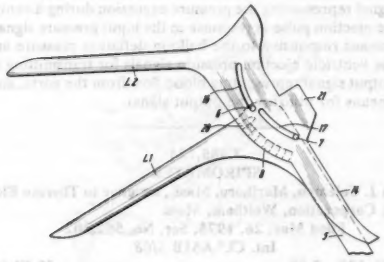
chamber means;
piston means in said chamber means;
a pair of rigid, substantially vertical posts mounted on one side of said piston means and situated adjacent opposite portions of said piston means;
guide means for said piston means mating with said posts for allowing rectilinear motion of said posts along said guide means;
means forming an air tight seal between said piston means and said chamber means; said chamber means, piston means, posts, guide means and seal means together forming a substantially air tight expansible chamber on a second side of said piston means opposite said one side;
means forming an opening through which expiratory flow is introduced into said expansible chamber, the introduction of expiratory flow producing movement of said piston means;
means mounted on the one side of said piston means for holding a recording surface, such recording surface when so held being movable rectilinearly with said piston means;
means for marking such recording surface; and
means for moving said marking means in substantially a straight line across such recording surface at a rate which is a known function of time, whereby simultaneous movement of said piston means and said marking means produces a plot of expiratory flow as a function of time.

3,985,125

VAGINAL SPECULUM

Ewald Rose, August-Antz-Str. 25, 55 Trier-Ehrang, Germany

Filed Mar. 21, 1975, Ser. No. 560,640
Claims priority, application Germany, Mar. 26, 1974, 2414369
Int. Cl.² A61B *1/32*
U.S. Cl. 128—17 **7 Claims**



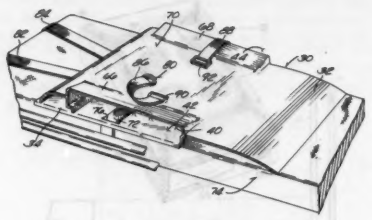
1. A vaginal speculum including a first member having a limb insertable into a vagina, a handle extending transversely of the limb, a pair of spaced substantially parallel cheeks connecting the rearward end of the limb and the handle, a second member having a limb insertable into a vagina and a yoke carried by the rearward end of such limb including spaced substantially parallel sheet sidewalls embracing the first member cheeks, guide means interconnecting and guiding the first and second members for relative swinging and spreading movement of the respective limbs, the cheeks and yoke sidewalls being disposed substantially parallel to the plane of movement of the limbs, and interlocking teeth means for locking the first and second members with their respective limbs in selected swung and spread relationship, the improvement comprising the interlocking teeth means including a row of teeth carried by each of the cheek means and the teeth of said row projecting outward generally transversely of the limb, a tooth carried by and projecting inward from each yoke sidewall and engageable with the adjacent row of teeth, the yoke sidewalls being flexible, and means for flexibly tilting the yoke sidewalls and thereby disengaging the engaged teeth.

3,985,126

PATIENT RETENTION AND SUPPORT

Clare E. Barkalow, Comstock Park, Mich., assignor to Michigan Instruments, Inc., Grand Rapids, Mich.

Filed Feb. 7, 1975, Ser. No. 547,872
Int. Cl.² A61N *7/00*
U.S. Cl. 128—53 **20 Claims**



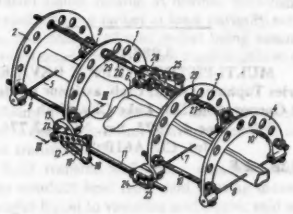
1. A patient cardiopulmonary resuscitative and back retention and support adapted for placement on a generally planar patient body support comprising in combination: a base and upper back support for supporting and raising only a portion of the patient above said patient body support having portions spaced from each other to form an opening and clearance for receipt of an external cardiac compressor platform, said opening extending tranversely of a patient positioned on said back support.

3,985,127

APPARATUS FOR SURGICAL TREATMENT OF THE KNEE JOINT

Mstislav Vasilievich Volkov, 1 Stroitelnaya ulitsa, 6, korpus 1, kv. 63, and Oganes Vardanovich Oganesian, ulitsa Pervomaiskaya, 74, kv. 87, both of Moscow, U.S.S.R.

Filed June 11, 1975, Ser. No. 586,134
Int. Cl.² A61F *5/04*
U.S. Cl. 128—84 R **4 Claims**



1. An apparatus for surgical treatment of the knee joint, which comprises: two pairs of needles each of which is designed to be driven through one of the joint ends; at least two brace structures in each of which the tips of said needles of one of said pairs are so secured that the brace structure and the needles form a rigid system, one pair of needles with the brace structure secured thereto defining one rigid system to be secured on one joint end, while the second pair of needles and the brace structure secured thereto define a second rigid system to be secured on the other joint end; two distractors rigidly coupled each at one end to one of said rigid systems; and two four-bar linkage means respectively coupling the opposite ends of said distractors to the other rigid system for precisely reproducing the movement of the knee joint while simultaneously maintaining a permanent minimal gap of predetermined magnitude between the joint ends.

3,985,128

PHOTOCURABLE CONTOUR CONFORMING SPLINT

Donald C. Garwood, Malibu, and Harry Taw, El Toro, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed June 2, 1975, Ser. No. 583,122
Int. Cl.² A61F 5/04
U.S. Cl. 128—90 12 Claims

1. An orthopedic splint capable of being conformed to the contours of a limb and hardened in place which comprises not more than two layers of fabric coated with a photocurable polymer composition,

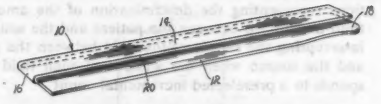
said fabric being at least 0.05 inches thick, having a density such that a pound covers a maximum of one square yard, and having no more than 80 percent of its surface as openings between threads, said polymer composition comprising 30 to 60 percent by weight of said splint.

3,985,129

DEVICE FOR USE IN PROTECTING A PATIENT DURING REMOVAL OF AN IMMOBILIZING CAST

Donald R. Huene, 7429 N. Valentine, Fresno, Calif. 93705

Filed Jan. 29, 1975, Ser. No. 545,127
Int. Cl.² A61F 15/02
U.S. Cl. 128—91 A 1 Claim



1. A device for use in cast removal procedures for removing a cast from a patient, comprising an elongated, substantially flexible body of a substantially U-shaped configuration including:

A. an elongated shield of a substantially planar configuration having length dimension equal to at least one-half the length dimension of a cast to be removed from a patient, a width dimension substantially greater than the width dimension of a kerf to be formed by a saw adapted to be employed in cutting the case, and a thickness dimension less than the distance between the surface of the skin of a patient and the opposed surface of the cast to be removed from the patient, and an end surface of a compound curve configuration for facilitating insertion of the shield between the skin of a patient and the cast to be removed, whereby the shield is adapted to be inserted between the skin of a patient and the cast to be removed; and

B. a cutter guide arranged in superimposed parallelism with the shield and integrally connected by a coupling segment of an arcuate configuration to the opposite end thereof having a length dimension substantially equal to the length dimension of the shield and a width dimension equal to one-half the width dimension of the shield, and including at least one straight edge surface extended the length of the guide in coinciding relation with the longitudinal plane of symmetry passing through said shield, along the length thereof, whereby the guide is adapted to be extended along the external surface of the cast to be removed for guiding a saw along the surface of the shield as the saw forms a kerf on the cast.

3,985,130

METHOD OF AND MEANS FOR TREATING BURN VICTIMS

Ronald H. Wideman, Menasha, Wis., assignor to Poly-Wide, Inc., Menasha, Wis.

Filed May 7, 1975, Ser. No. 575,413
Int. Cl.² A61F 13/00
U.S. Cl. 128—132 R 17 Claims

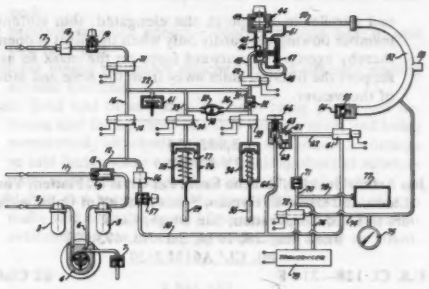
1. A method of treating and providing custodial care for burn and decubitus patients comprising interposing between a patient and a surface on which he is supported a generally nonadhering disposable laminated fabric having outer layers of nonwoven non-migrating fibrous material and an inner layer of foam material therebetween fastened by an adhesive to the outer layers over their entire extent.

3,985,131

INFANT AND PEDIATRIC VENTILATOR

Keith E. Buck, Alamo; Sotiris Kitrilakis, and Thomas C. Robinson, both of Berkeley, all of Calif., assignors to Searle Cardio-Pulmonary Systems Inc., Emeryville, Calif.

Filed Nov. 20, 1974, Ser. No. 525,309
Int. Cl.² A61M 16/00
U.S. Cl. 128—145.8 4 Claims



1. An infant and pediatric volume ventilator comprising a patient's airway, a first cyclicly operating displacement volume controller having a predetermined volume, means including a first valve for connecting said first controller to said airway, a second cyclicly operating displacement volume controller having a volume larger than said predetermined volume, means including a second valve for connecting said second controller to said airway, means for supplying said volume controllers with breathing gas, means for cross-connecting said connecting means to each other between said valves and said airway, means for selectively closing said first valve and said second valve, a flow restricting device in said cross-connecting means, and means for precluding flow into said second volume controller directly from said supply means.

3,985,132

FILTER MASK

Elvin L. Boyce, and William Keith Robinson, both of Salt Lake City, Utah, assignors to Tape-Licator, Inc., Riverton, Utah, a part interest

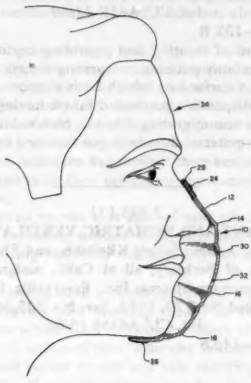
Filed Dec. 13, 1974, Ser. No. 532,340
Int. Cl.² A62B 23/02
U.S. Cl. 128—146.2 3 Claims

3. An improved filter mask to be worn across the nose and mouth of a wearer comprising:

an initially planar filter medium folded into at least one pleat intermediate between an upper and a lower border, each end of the pleat being secured to each edge borders of the planar medium;

the upper border having a yieldably deformable member parallel thereto so as to selectively conform the upper border of the mask to the nasal contour of the wearer;

the improvement comprising at least one resilient elongated, thin stiffening member retained in the vicinity of



and parallel to the pleat, the elongated, thin stiffening member bowing outwardly only when the pleat is opened thereby exerting an outward force on the mask so as to support the filter medium away from the nose and mouth of the wearer.

3,985,133

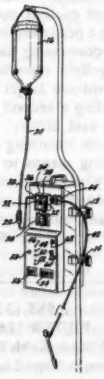
IV PUMP

Jon Arthur Jenkins, Rancho Santa Fe; Orris H. Flatten, Yorba Linda, and Oscar E. Hyman, Santa Ana, all of Calif., assignors to Imed Corporation, San Diego, Calif.

Filed May 28, 1974, Ser. No. 473,901

Int. Cl.² A61M 5/20

U.S. Cl. 128—214 F **62 Claims**



1. A volumetric pump for pumping between a patient and a source a volume of fluid at a preselected controlled rate until a preselected volume of fluid has been pumped, including

an output line,

volumetric means for receiving the volume of fluid from the source and providing the fluid to the output line,

the volumetric means including a chamber of a predetermined volume per increment of displacement which predetermined volume is a fraction of the volume of fluid from the source and a fraction of the fluid to be pumped to the output line,

a plunger movable within the chamber on an incremental basis in a first direction for filling the chamber and movable within the chamber, in a second direction opposite to the first direction, on an incremental basis for emptying the chamber,

plunger means coupled to the plunger for driving the plunger on the incremental basis in the first direction to fill the chamber and for driving the plunger on an incremental basis in the second direction to empty the chamber,

a stepper motor constructed to operate in increments each representative of a particular distance,

control means, including the stepper motor, operatively coupled to the plunger driving means to obtain an incremental operation of the plunger driving means for driving the plunger on the incremental basis in the first direction and to obtain an incremental operation of the plunger driving means for driving the plunger on an incremental basis in the second direction,

means for providing an indication representing the preselected amount of fluid to be supplied between the patient and the source,

means responsive to the incremental operation of the plunger driver means in driving the plunger on an incremental basis in the second direction for counting the number of such incremental operations to obtain a determination of the amount of fluid transferred between the source and the patient, and

means responsive to the count of the incremental operations representing the determination of the amount of fluid transferred between the patient and the source for interrupting the supply of the fluid between the patient and the source when the amount of such fluid corresponds to a preselected incremental count.

3,985,134

EXTRACORPOREAL BLOOD CIRCUIT

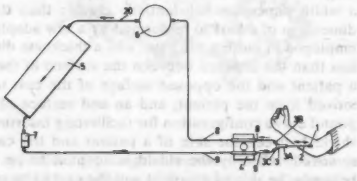
Jean Lissot, Brie Comte Robert, and Andre Sausse, Sceaux, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Nov. 25, 1974, Ser. No. 527,041

Claims priority, application France, Nov. 26, 1973, 73.42007; Oct. 9, 1974, 74.33982

Int. Cl.² A61M 1/03

U.S. Cl. 128—214 R **8 Claims**



1. An extracorporeal blood circuit comprising, in combination:

a. a haemodialyser having an inlet and an outlet;

b. a continuously operable pump of a type which exerts at most only a slight haemolysing effect and having an inlet and an outlet;

c. a hollow needle which can be introduced into a patient's blood vessel;

d. a Y-shaped coupling having a stem connected to said hollow needle and first and second branches;

e. an inlet pipeline connecting said first branch to the inlet of the pump;

f. an intermediate pipeline connecting the outlet of the pump to the inlet of the haemodialyser;
g. an outlet pipeline connecting the outlet of the haemodialyser to the second branch of the Y-shaped coupling;
h. a bubble trap in said outlet pipeline;
i. a device which seals the inlet and outlet pipelines intermittently, said device including means to seal both the pipelines simultaneously for an instant in the course of a cycle; and
j. drive means which drive said device in a cyclic manner at a predetermined frequency;

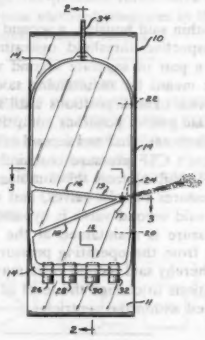
at least one of the haemodialyser, the pump, the intermediate pipeline and the outlet pipeline having a variable internal volume which is sensitive to the variations in the differential pressure instantaneously existing between its interior and atmosphere.

3,985,135

DUAL CHAMBER RESERVOIR

Walter L. Carpenter, Arlington Heights, and Ronald J. Leonard, Harvard, both of Ill., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Mar. 31, 1975, Ser. No. 563,861
Int. Cl.² A61M 5/14
U.S. Cl. 128—214 D **4 Claims**



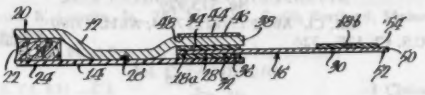
1. In a reservoir for receiving and storing blood and the like for a variety of surgical procedues, having intake and outlet ports, and of at least a capacity capable of receiving a major portion of the exsanguinated blood supply of an infant undergoing a hypothermic surgical procedure, said reservoir being made of a pair of plastic sheets sealed together with a peripheral seal, the improvement comprising: chamber separator means dividing the interior of said reservoir into a primary chamber and a secondary chamber, and defining a flow channel providing communication between said primary and secondary chambers, said chamber separator means defining first and second, angularly-related seal lines between said plastic sheets, said lines being spaced transversely to the axis of said reservoir, said lines joining to form an apex which is spaced from the edges of said peripheral seal, to define said flow channel between said apex and one edge of the peripheral seal, said plastic sheets extending between said angularly-related seal lines, and said intake and outlet ports communicating with the primary chamber.

3,985,136

TAB FASTENER HAVING FIXED END ANCHORED TO DIAPER FACING AND BACKING

Talivaldis Cepuritis, Kenilworth, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Sept. 16, 1975, Ser. No. 613,782
Int. Cl.² A61F 13/16; A41B 13/02
U.S. Cl. 128—287 **12 Claims**



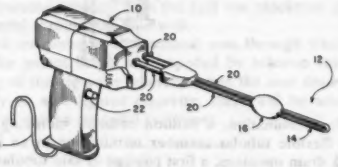
1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:
an elongated tape segment attached to said diaper at a marginal location thereof, having a fixed end provided with an adhesive coating on both faces thereof and a free end;
a pressure-sensitive adhesive coating on one face of said free end; and
release means releasably attached to said adhesive coating on said free end;
said fixed end of said tape segment being positioned between said facing sheet and said backing sheet and being permanently attached by means of said adhesive coatings to said facing sheet and to said backing sheet at substantially juxtaposed marginal locations thereof; and
said free end being separable from said release means to make said adhesive-coated free end of said tape segment available for use in securing said diaper about an infant.

3,985,137

TIP FOR VETERINARY SURGICAL CAUTERIZATION INSTRUMENT

Brian T. Donohue, W. Milford Animal Hospital, Oakridge Road (Rte. 23), Oakridge, N.J. 07438

Filed Sept. 27, 1974, Ser. No. 510,109
Int. Cl.² A61B 17/36
U.S. Cl. 128—303.17 **1 Claim**



1. In an electrosurgical cauterization instrument, for insertion into a body cavity, having a variable current control from a power source, an insulated handle having an electrode receiving end and an operative electrode tip comprised of a suitable electrical resistance material capable of producing heat, wherein the improvement comprises:
a slidable ovular protective insulating sheath, being positioned near said tip, for insertion into an orifice of said body cavity resulting in spreading and protection of healthy and sensitive tissue during a cauterization procedure, said slidable sheath having two longitudinal bores through which a U-shaped electrode forming said tip passes.

3,985,138

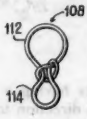
PREFORMED LIGATURES FOR BLEEDERS AND METHODS OF APPLYING SUCH LIGATURES

Robert K. Jarvik, 5974 Holladay Blvd., Salt Lake City, Utah 84121

Continuation-in-part of Ser. No. 283,773, Aug. 25, 1972, Pat. No. 3,841,521, which is a division of Ser. No. 64,161, Aug. 17, 1970, Pat. No. 3,687,138. This application Oct. 10, 1974, Ser. No. 513,929

Int. Cl.² A61B *17/12, 17/04;* A61L *17/00*

U.S. Cl. 128—326 8 Claims



1. A one piece ligature comprising a seamless ring of suture material twisted and tied into two loops divided by a slipknot such that by pulling on one loop or by spreading one loop open the other may be constricted.

3,985,139

COMBINATION BALLOON CATHETER AND EMERGENCY MEANS FOR DEFLATING THE BALLOON

Leonard J. Penar, 3623 W. Cermak Road, Chicago, Ill. 60623

Filed Aug. 25, 1975, Ser. No. 607,341

Int. Cl.² A61M *25/00*

U.S. Cl. 128—349 B 8 Claims

1. In combination, a balloon catheter including an elongated flexible tubular member terminating in an inner end having drain openings, a first passage in said tubular member in communication with said drain openings at said inner end and terminating at its outer end in an enlarged opening, an inflatable balloon member attached to the exterior of said tubular member adjacent said drain openings, a second passage in said tubular member communicating with said balloon member for inflating and deflating said balloon member,

a flexible tube of a size and shape for insertion in said first passage and having a length at least equal to that of said first passage, an opening adjacent one end of said flexible tube, which opening is generally in alignment with said balloon member when said flexible tube has been fully inserted in said first passage, and a thin flexible wire-like member of a size and shape to be inserted in said flexible tube and having a length at least sufficient to extend through said flexible tube and through said opening, said flexible wire-like member having a sharpened end for use in piercing said tubular member, after passing through said flexible tube opening.

3,985,140

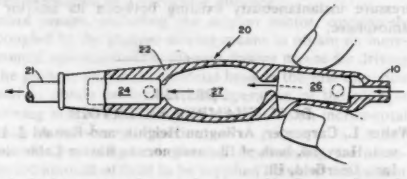
DUAL PRESSURE VALVE FOR USE IN VENTRICULAR SHUNT SYSTEM

Donald L. Harris, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed June 30, 1975, Ser. No. 591,657

Int. Cl.² A61M *27/00*

U.S. Cl. 128—350 V 5 Claims



1. A dual pressure shunt valve assembly for use in series with a ventricular catheter and an implantable drainage system employed in venting CSF from a patient's ventricles, said valve assembly comprising:

a housing;

disposed within said housing, a first one-way valve having a threshold operating pressure appropriate for maintaining a relatively low level of CSF pressure within the ventricles; and

disposed within said housing, a second one-way valve having a respective threshold operating pressure, means defining a pair of separate second valve positions, and retention means for maintaining said second valve in a selected one of said positions until said second valve is shifted, said pair of positions comprising an on-line position, wherein said first and second valves are in series and the patient's CSF pressure is maintained at a relatively high level resulting from the combined effect of the operating pressures of said valves, and an off-line position, wherein said second valve is bypassed and the patient's CSF pressure is maintained at the relatively low level resulting from the operating pressure of said first valve alone, whereby said second valve may be shifted between said positions to change the level of CSF pressure to be maintained within the ventricles.

3,985,141

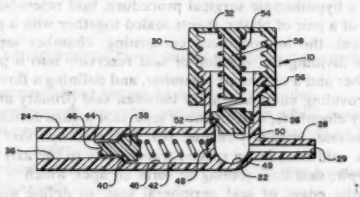
INFLATION AND PRESSURE RELIEF VALVE

Theodore H. Stanley, and Jerrold L. Foote, both of Salt Lake City, Utah, assignors to The University of Utah, Salt Lake City, Utah

Filed Mar. 10, 1975, Ser. No. 557,192

Int. Cl.² A61M *16/00*

U.S. Cl. 128—351 3 Claims



1. A pressure relief valve for a cuff on an endotracheal tube having an inflatable cuff which is inflated with an inflation

device probe, the pressure relief valve comprising in combination:

a valve body;

an inlet into the valve body, the inlet having a manually operable inlet valve comprising an inlet valve seat and a valve head held against the inlet valve seat by an inlet spring, the valve head having an axial stem extending through the inlet valve seat into the inlet for engagement and movement of the valve head away from the inlet valve seat when the inflation device probe is inserted into the inlet, the stem having a notch in its end to permit escape of gases from the inflation device probe when the same is an engagement with the stem, the inlet valve selectively obstructing the inlet into the valve body with an inlet spring resiliently urging the valve head to the closed position to maintain inflation pressure within the cuff;

an outlet from the valve body operable to communicate gases from the inlet to an inflation lumen of the cuff; and

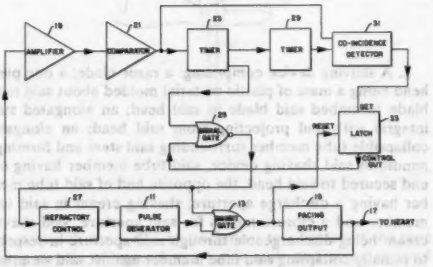
a pressure relief valve in the valve body, the pressure relief valve comprising a riser and a cap threadedly engageable on the riser, the riser including a relief valve seat and a valve body which is held against the relief valve seat by a relief spring, the relief spring cooperating between the valve body and the cap so that rotation of the cap adjusts the compression of the relief spring and, correspondingly, the pressure in the valve body at which the pressure relief valve will open, the valve head being adjustably spring biased to the closed position, the valve head and cap including indicia and the relief spring being coordinated with the indicia to provide predetermined incremental pressure settings, the pressure relief valve thereby being operable to release elevated pressures in the valve body above the adjusted pressure setting.

3,985,142

DEMAND HEART PACER WITH IMPROVED INTERFERENCE DISCRIMINATION

Geoffrey Gordon Wickham, Lane Cove, Australia, assignor to Telectronics Pty. Limited, Australia

Filed Jan. 14, 1975, Ser. No. 540,973
Int. Cl.² A61N 1/36
U.S. Cl. 128—419 PG **18 Claims**



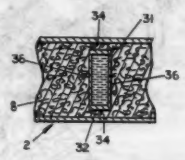
1. A heart pacer comprising terminal means for connection to a patient's heart, free running pulse generating means for generating heart stimulating electrical impulses and for applying said impulses to said terminal means, means for deriving control pulses in response to the appearance on said terminal means of signals above a predetermined level generated by the beating action of said patient's heart and to other signals, timing means responsive to said control pulses for generating first and second timing pulses of first and second predetermined time periods, means responsive to said control pulses and to said timing means for generating coincidence pulses when said control pulses occur after said first predetermined time period but prior to completion of said second predetermined time period, timing reset means responsive to said first timing pulses to reset the timing cycle of said heart pulse generating means to begin a new timing cycle prior to the normal commencement of a new timing cycle, and means responsive to said coincidence pulses for preventing operation of said timing reset means.

3,985,143

SELF EXTINGUISHING CIGARETTE

James B. Lappin, Jr., 751 Main St., South Portland, Maine 04106

Filed Feb. 21, 1975, Ser. No. 551,537
Int. Cl.² A24D 1/10
U.S. Cl. 131—4 A **1 Claim**



1. In a cigarette comprised of a combustible tube with tobacco therein,

means for extinguishing the cigarette when the burning tobacco has advanced to a predetermined location toward the rear end thereof,

said means comprising a unitary water filled circular container positioned within said cigarette,

said container being in the form of a disc having a peripheral wall and two spaced faces with its axis extending longitudinally of the cigarette and with said peripheral wall paralleling and spaced from the interior of said tube

the diameter of said container being greater than its longitudinal dimension and the cross sectional area of said container taken at right angles to said axis being greater than the remaining cross sectional area within the tube through which the smoke passes,

said container being made of material capable of being ruptured by the heat of the burning tobacco as it reaches said container,

said container wall being of one thickness of said material and the said face of said disc that is remote from the rear end of said cigarette being of thinner and more delicate material that is more susceptible to heat from the advancing burning tobacco than the said one thickness of said material forming the said wall,

the said remaining cross sectional area through which the smoke passes being less impeded by tobacco than the body of the cigarette whereby when the user draws normally on said lighted cigarette, there will be adequate flow of smoke past said container.

3,985,144

APPARATUS FOR FORMING CIGARETTE FILTERS

Leslie E. Payne, 3423 Luther St., Winston-Salem, N.C. 27107

Division of Ser. No. 434,747, Jan. 18, 1974, Pat. No. 3,958,498. This application June 5, 1975, Ser. No. 584,232
Int. Cl.² A24C 5/50
U.S. Cl. 131—92 **4 Claims**

1. An apparatus for forming filters of a filter cigarette comprising:

a. a first set of seat means for receiving one filter cigarette;

b. conveyor means for carrying said first set of seat means and moving said first set of seat means in a selected path;

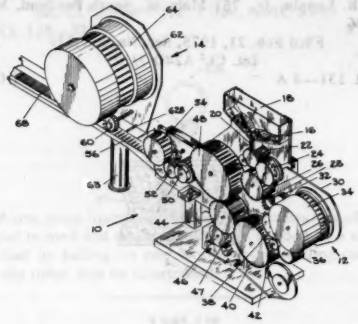
c. second set of seat means located on one side of said first set of seat means, the seats of said second seat means corresponding to the seats in said first seat means, said

second seat means receiving the tobacco rod end of the filter cigarette;

d. means for maintaining a negative pressure in said second seat means;

e. means for manipulating said second set of seat means;

f. gripper means including a tubular gland member which receives the filter end of the cigarette, said gland means being inflated to grasp the filter cigarette as it is being formed;



g. means for providing pressure to said gland, a positive pressure to inflate said gland after said filter cigarette is inserted therein and at least an atmospheric pressure to deflate said gland after forming the filter but before said cigarette is removed from the gland;

h. forming means associated with said seat means for forming the filter into a desired configuration;

i. means for manipulating said forming means so that it will sequentially engage and disengage from said filters; and

j. means for maintaining said forming means at a selected temperature.

3,985,145

METHOD AND APPARATUS FOR CHANGING THE MOISTURE CONTENT OF TOBACCO

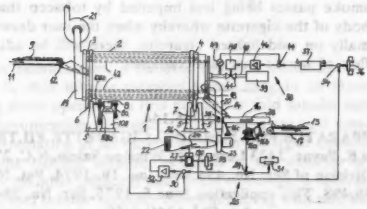
Wolfgang Broscheit, Trittau; Peter Schwarz, Rellingen, and Waldemar Wochnowski, Hamburg-Meiendorf, all of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed July 30, 1974, Ser. No. 493,063

Claims priority, application Germany, Aug. 10, 1973, 2340490

Int. Cl.² A24B *3/04*

U.S. Cl. 131—135 **7 Claims**



5. Apparatus for changing the moisture content of fibrous material, particularly tobacco, comprising means for subjecting fibrous material in a conditioning zone to the direct action of a gaseous medium having a limited capacity to change the moisture content of fibrous material and to change said moisture content at a relatively high rate of speed; adjustable means for changing the moisture-changing action of said gaseous medium and for normally maintaining said action at a predetermined value; means for subjecting the fibrous material in said zone to the action of a fluid medium having a greater capacity to change the moisture content of fibrous material and to change said moisture content at a relatively low rate of speed; means for measuring the changed moisture content of said fibrous material and for producing a first signal when the measured moisture content deviates from a predetermined moisture content whereby the intensity of said first signal represents the extent of deviation; means for adjusting said changing means in immediate response to said first signal so that the moisture-changing action of said gaseous medium upon the fibrous material in said zone is changed from said predetermined value to reduce said difference to an extent which is a function of the intensity of said first signal; second adjustable means for changing the moisture-changing action of said fluid medium; and means for adjusting said second changing means in response to said first signal, including means for producing a second signal which is indicative of the extent of deviation of moisture-changing action of said gaseous medium from said predetermined value in response to said first signal, and a proportional-and-integral amplifier having means for immediately changing the moisture-changing action of said fluid medium in response to said second signal so as to reduce said difference and for changing the moisture-changing action of said fluid medium so as to reduce said difference to an extent which is a function of deviation of intensity of said second signal from a predetermined intensity.

3,985,146

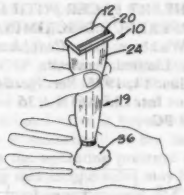
DISPOSABLE SHAVING KIT

William N. Albach, E. Brunswick, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed May 29, 1975, Ser. No. 581,790

Int. Cl.² A45D *40/00*

U.S. Cl. 132—79 B **1 Claim**



1. A shaving device comprising: a razor blade; a one piece head being a mass of plastic material molded about said razor blade to embed said blade in said head; an elongated stem integral with and projecting from said head; an elongated collapsible tube member surrounding said stem and forming a handle of said shaving device; said tube member having one end secured to said head, the opposite end of said tube member having a discharge aperture; shaving cream in said tube member and a closure means for said aperture, said shaving cream being dischargeable through said aperture in response to radially collapsing said tube member against said stem; said stem extending over substantially the entire length of said tube member for stiffening said handle.

3,985,147

DENTAL IMPLEMENT FOR REMOVING STAINS FROM TEETH

Craig M. Ricketts, and Robert M. Ricketts, both of 1283 Rimmer Ave., Pacific Palisades, Calif. 90272

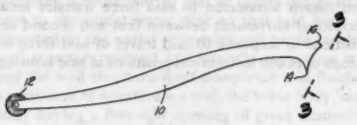
Filed Mar. 13, 1975, Ser. No. 558,127

Int. Cl.² A61C *15/00*

U.S. Cl. 132—89 **7 Claims**

1. A manually-operable dental implement comprising an elongated handle shaped to be grasped in the hand of a user to perform a stain removal operation on the teeth of a patient,

and an abrasive-impregnated member mounted on one end of the handle for removing stains from the teeth, said member



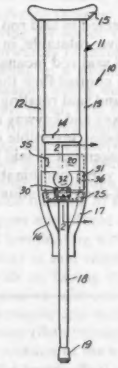
being in the form of a disc turnable about an axis traversing the longitudinal axis of the handle to different angular positions.

3,985,148

CRUTCH CARRY-ALL ATTACHMENT

Phillip B. Cadman, 9206 Chestwall St., Orangevale, Calif. 95662

Filed Oct. 15, 1975, Ser. No. 622,505
Int. Cl.² A45B 1/00
U.S. Cl. 135—66 **5 Claims**



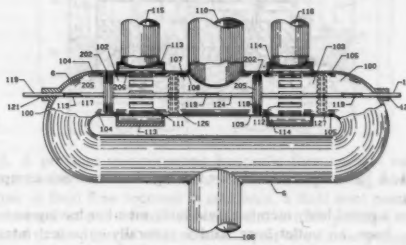
1. A crutch carry-all for attachment to a crutch of the type having a pair of spaced apart side rails and a leg secured therebetween and extending downwardly therefrom comprising a side panel including a bottom flange extending perpendicularly inwardly therefrom and adapted to be placed between the spaced apart side rails, a second, spaced, relatively short side panel having a flange extending perpendicularly inwardly therefrom with said flanges arranged in horizontal overlapping position and adapted to be placed between the spaced apart side rails, means extending through said flanges for detachably securing said flanges of said side panel and said short side panel to the leg of the crutch, a hinged side panel pivotally secured to said short side panel and adapted to move to a generally horizontal position, providing access to the compartment formed by said spaced panels and means on said hinged side panel adapted to cooperate with said side rails for supporting said hinged side panel in closed position.

3,985,149

REVERSING FLOW VALVE

Joseph M. Tyrner, Brookside, and William E. Watson, Mount Tabor, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 378,749, July 12, 1973, which is a division of Ser. No. 218,605, Jan. 17, 1972, Pat. No. 3,897,800, which is a continuation of Ser. No. 877,720, Nov. 18, 1969, abandoned. This application Apr. 25, 1975, Ser. No. 571,664
Int. Cl.² F16K 11/07
U.S. Cl. 137—1 **3 Claims**



1. A process for reversing gas flow comprising the steps of:

a. introducing a gas stream into a valve through an inlet port thereof to a first manifold chamber therewithin;

b. directing said gas stream from said first manifold chamber to a first cylinder chamber of said valve;

c. removing said gas stream from said first cylinder chamber by directing said gas stream through a first port therein;

d. introducing said gas stream into a second cylinder chamber of said valve through a second port of said valve;

e. directing said gas stream from said second cylinder chamber to a second manifold chamber of said valve;

f. removing said gas stream from said second manifold chamber by directing said gas stream through an outlet port therein;

g. reversing the direction of gas flow through said first and second cylinder chamber ports without changing the direction of gas flow through said inlet and outlet ports;

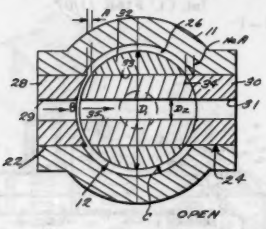
h. maintaining uninterrupted communication between said inlet port and said first and second ports of said first and second cylinder chambers, and uninterrupted communication between said first and second ports of said first and second cylinder chambers and said outlet port for substantially the entire time during which the direction of gas flow is being reversed said uninterrupted communication being maintained by providing a piston in each of said first and second cylinder chambers, each piston having a first position therein which permits communication between said inlet port and said first port of said first cylinder chamber and communication between said second port of said second cylinder chamber and said outlet port, said pistons being slideably arranged in said first and second cylinder chambers for movement over the first and second ports thereof to a second position in said cylinder chambers which terminates communication between said inlet port and said first port of said first cylinder chamber and communication between said second port of said second cylinder chamber and said outlet port and which provides communication between said inlet port and said second port of said second cylinder chamber and said outlet port; and

i. accelerating said pistons to maximum velocity prior to passage thereof over said cylinder chamber ports.

3,985,150
BALL VALVE FOR VALVING ABRASIVE FLUIDS

Peter G. Kindersley, Glen Falls, N.Y., assignor to Kamyr Valves, Inc., Glens Falls, N.Y.

Filed June 3, 1975, Ser. No. 583,291
Int. Cl.² F16K 5/06
U.S. Cl. 137—240 10 Claims



1. A ball valve assembly for valving abrasive fluids comprising

a. a metal body member, said body member having an inlet bore, an outlet bore, and a generally spherical interior chamber adapted to receive a ball member,

b. a generally spherical metal ball valve member contained in said body member interior chamber and rotatable about an axis with respect to said body member, said ball valve member having a bore therethrough,

c. means for providing resistance of said valve assembly to deterioration by the action of abrasive fluids to be valved thereby, said means comprising (i) a tubular inlet insert located within said inlet body bore, said inlet insert having a passageway formed therethrough, (ii) a tubular valve member insert located in said ball valve member bore, said valve member insert having a passageway formed therethrough, (iii) a tubular outlet insert located within said body outlet bore, said outlet insert having a passageway formed therethrough, each of said inserts being formed of abrasion-resistant material,

d. means for rotating said valve member with respect to said body member from an open position wherein said passageways are aligned and fluid may flow therethrough, through a throttling position, to a closed position wherein portions of said valve member insert block the passage of fluid from said inlet insert passageway to said valve member passageway and portions of said valve member insert and portions of said outlet insert block the passage of fluid from said valve member insert passageway to said outlet insert passageway, and

e. said valve member insert having arcuate sections formed at the ends thereof adjacent said outlet insert and said inlet insert, the arcuate section of said valve member insert adjacent said inlet insert having a length greater than or equal to the diameter of the inlet insert passageway and the arcuate section of said valve member insert adjacent said outlet insert cooperating with an arcuate section of said outlet insert which has a length greater than the diameter of the valve member insert passageway.

3,985,151
VALVE ACTUATOR

Jopling P. Smith, Houston, Tex., assignor to Keystone International, Inc., Houston, Tex.

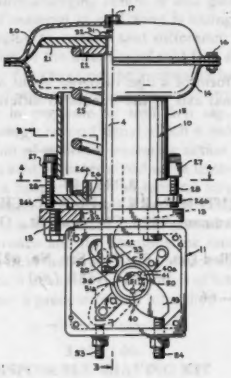
Continuation of Ser. No. 406,164, Oct. 15, 1973, Pat. No. 3,929,058. This application June 4, 1975, Ser. No. 582,539
Int. Cl.² F16K 31/165
U.S. Cl. 137—269 10 Claims

1. In combination, a valve actuator and a valve having an operating shaft comprising:

a. an actuator housing;

b. force transfer means disposed in said actuator housing for travel from one terminal position in said housing to another terminal position in said housing;

c. rod means connected to said force transfer means for reciprocal movement between first and second terminal positions in response to said travel of said force transfer means between its terminal positions in said housing; and



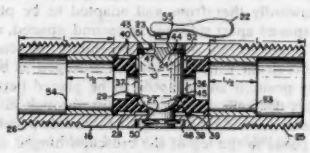
d. crank means connected to said rod means and the operating shaft of said valve, rotatable, in response to said reciprocal movement of said rod means, about the axis of said operating shaft, to control flow through said valve;

e. said crank means and said rotating shaft being connected by engagement of key and keyway means carried thereon, said crank means being invertible on said operating shaft so that upon reengagement of said key and keyway means said actuator and valve combination may be converted from a relative fail-open operation to a relative fail-close operation.

3,985,152
UNDER FIXTURE VALVE

Thomas Albanese, 116 Norlen St., Las Vegas, Nev. 89107

Filed May 19, 1975, Ser. No. 578,475
Int. Cl.² F16K 5/04
U.S. Cl. 137—360 5 Claims



1. An under-fixture valve for threaded connection at one end to an outlet water pipe within a wall structure and at its

other end to a fixture pipe leading to an overhead fixture, comprising, in combination:

a. a pipe section constituting an elongated valve body exteriorally threaded at each end and of a dimension corresponding substantially to that of piping designed to connect to the outlet water pipe so that said body may be threaded to the outlet waterpipe and projected from the wall structure without any laterally projecting structure and the wall structure itself completed and finished with a minimum of interference with the valve body, said valve body having a first side opening of given diameter intermediate its ends and a second diametrically opposite side opening of smaller diameter;

b. an integrally molded plastic member of cylindrical shape receivable in one end opening of said valve body and having a longitudinal bore therethrough and a transverse passage entering the plastic member through an entrance side opening of given diameter and exiting from the member through a diametrically opposite exit side opening of smaller diameter, said diameters corresponding respectively to said first mentioned given diameter and smaller diameter of said valve body and being positioned in registration therewith, said passage in said plastic member intercepting said longitudinal bore to define a valve chamber in their common volumes having a cylindrically shaped wall portion surrounding said entrance opening tapering inwardly to define a concave hemispherical shape surrounding the exit opening, the peripheral edges of the longitudinal bore openings intercepting opposite portions of the wall defining said valve chamber in said plastic member and the inner peripheral edge of said exit opening, extending beyond the wall surfaces slightly to define annular ribs surrounding said bore openings and exit opening to serve as O-rings;

c. a valve head having an upper exterior cylindrical wall portion tapering inwardly to define a convex hemispherical shape terminating in a smaller cylindrical stem and having a flow passage passing diametrically therethrogh from one side to the other, said valve head being receivable through said first side opening of given diameter in said valve body and said registering entrance opening in said plastic member to seat in said valve chamber with its cylindrical stem passing through said exit opening and into said second side opening of smaller diameter in said valve body, the upper end of said cylindrical wall portion of said valve head terminating within said first side opening of given diameter in said valve body and including an annular groove with an O-ring seated in said groove to provide a water seal at said side opening, the exterior cylindrical and hemispherical surface of said valve head engaging said annular ribs surrounding said bore openings and exit opening, rotation of the valve head about an axis perpendicular to the longitudinal axis of the bore through said plastic member when positioned in said valve chamber to a first position aligning said flow passage with said bore to pass water through said valve body and rotation of said valve head 90° from said first position to a second position moving said flow passage out of alignment with said bore to block the flow of water through said valve body, said second side opening in said valve body including a recessed area at its outer edge, said stem of said valve head extending into and terminating in said recessed area and having an annular groove; and,

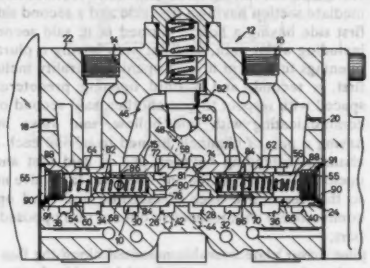
d. a spring washer receivable in said groove and recessed area shaped to exert a spring force against said stem tending to pull it further through said exit opening and registering second side opening to thereby hold said valve head in secure seating engagement with said annular ribs in said valve chamber whereby said valve head when positioned in said plastic body has its upper end and lower stem flush with the outer surface of said valve body, said valve head additionally serving to hold said integrally molded plastic member against longitudinal movement in said valve body.

3,985,153

PRESSURE COMPENSATING VALVE SPOOL ASSEMBLY FOR A HYDRAULIC CONTROL VALVE

Vitas T. Thomas, Racine, Wis., assignor to Tomco, Inc., Racine, Wis.

Filed Aug. 28, 1974, Ser. No. 501,180
Int. Cl.² F16K *11/00*
U.S. Cl. 137—596 **7 Claims**



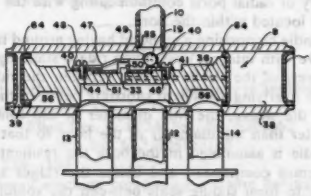
1. A pressure compensating hydraulic flow control valve spool for a hydraulic valve including: a housing having a bore, a pair of fluid flow recesses in said bore, a fluid inlet passage connected to one of said recesses and a tank passage connected to the other of said recesses, a pair of cylinder passages connected to said bore, a pair of tank passages connected to said bore, and a fluid pressure passage connected to said fluid inlet passage and to said bore, said valve spool comprising a cylindrical spool slidably positioned in said bore for movement in opposite directions from a neutral position to operative positions in said bore, said spool in the neutral position providing fluid communication between said fluid flow recesses, the flow of fluid between said fluid flow recesses being constrained on movement of said valve spool from the neutral position to direct fluid from the fluid inlet passage to flow through said fluid pressure passage, said spool on movement from said neutral position including means for providing fluid communication from said pressure passage to one of said cylinder passages and from the other of said cylinder passages to one of said tank passages, and fluid pressure compensating valve means in each end of said valve spool for controlling the fluid flow rate between said fluid pressure passage and said cylinder passage, said valve means being connected to respond to the pressure differential between said cylinder passage and said inlet passage whereby the fluid flow rate across the valve means is controlled by maintaining a predetermined pressure differential between the pressure in the cylinder passage and the pressure in said fluid inlet passage.

3,985,154

FOUR-WAY VALVE

David P. Hargraves, Webster Groves, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 24, 1975, Ser. No. 625,585
Int. Cl.² F16K *11/07, 31/124*
U.S. Cl. 137—625.29 **15 Claims**



1. A valve assembly comprising:

a housing having a cavity in it, said housing having an outlet and two working lines on a first side of it, and an inlet on a side opposite said outlet and said two working lines;

a main valve member disposed in said cavity and being axially movable therein, said valve member having opposed piston ends which cooperated with said housing to define a pair of opposed chambers in said housing, said valve member having an intermediate section, said intermediate section having a first side and a second side, said first side having a hollow formed in it, said second side including a flat area, said flat area having a plurality of openings formed in it, said opening plurality including a first, a second, and a third opening predeterminedly spaced with respect to one another, said second opening communicating with said hollow, said valve member having a pair of channels formed in it, one each of said channels extending between one of said first and third openings in said flat area and an end of said valve member so that respective ones of said first and third openings communicate with respective ones of said opposed chambers;

a pilot driver plate movably mounted along the flat of said main valve member, said pilot driver plate having a first surface, said first surface having an opening in it, said opening being aligned with the three predeterminedly spaced ones of said opening plurality in said main valve member;

pilot slide means mounted in the opening of said pilot driver plate, said pilot slide means including means for interconnecting said second opening with one of said first and third openings in said main valve member;

means for holding said pilot slide in position within the opening of said pilot driver plate;

means for maintaining said pilot driver plate in position along the flat side of said main valve member; and

means for moving said pilot driver plate between at least a first position and a second position, said pilot slide means moving in response to movement of said pilot driver plate so as to alternate the interconnection of said second opening with one of said first and third openings in said main valve member.

3,985,155

PLUG VALVES

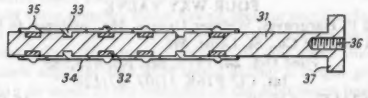
Douglas Daniel John Nightingale, St. Albans, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 6, 1975, Ser. No. 584,531

Claims priority, application United Kingdom, June 25, 1974, 28100/74

Int. Cl.² F16K *11/06, 3/00*

U.S. Cl. 137—625.48 **8 Claims**



1. A plug valve comprising a valve body having a bore and a plurality of radial ports communicating with the bore, and a spindle located within the bore,

the spindle comprising a mandrel having around it a plastics sleeve with integral upstanding ridges standing proud of the rest of the sleeve surface between the ridges, each ridge overlying a resilient substrate between the mandrel and the sleeve, the free diameter of the spindle being greater than the diameter of the bore so that when the spindle is assembled in the bore the resilient substrate becomes compressed and biases the ridges against the bore to form sliding seals between the spindle and the bore, the diameter of the spindle in thet areas between the ridges being less than the diameter of the bore to provide space for fluid to flow therebetween when passing from one port to another, the configuration of the ridges being arranged to divide said space between the spindle and the bore and define at least one discrete passage alignable with selected ports to permit fluid flow therebetween.

3,985,156

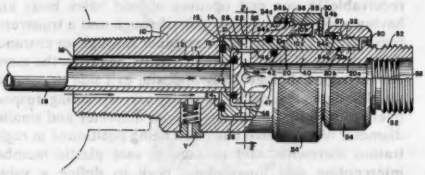
GAS AND LIQUID FLOW CONTROL VALVE

Robert Walker, Providence, R.I., assignor to Bristol Screw Products Corporation, Providence, R.I.

Filed Nov. 19, 1974, Ser. No. 525,151

Int. Cl.² F16K *11/12, 24/00*

U.S. Cl. 137—637.2 **6 Claims**



1. A gas and liquid flow control valve comprising a valve body having a bore therethrough, said bore having an inlet portion and an enlarged outlet portion separated by an annular shoulder portion, a first tubular valve element disposed in said outlet portion and being movable relative thereto between opened and closed positions, a second tubular valve element disposed in said first tubular valve element and being movable relative thereto between opened and closed positions, said second tubular valve element containing an exit channel in the top portion thereof, a gas inlet and a liquid inlet, said liquid inlet fixed to and extending through said first tubular valve element, and said gas and liquid inlets concentrically arranged with respect to each other, manually operated means exteriorly carried by said valve body and said first and second tubular valve elements, said means being selectively movable relative to said tubular valve elements whereby the same may be simultaneously moved between opened and closed positions, and said means including a first and second operator means for said first and second tubular valve elements, respectively, whereby one of said tubular valve elements may be operated independently of the other, a gas flow path being open when said first tubular valve element is in the open position and being closed when said first tubular valve element is in the closed position, said gas flow path being through said gas inlet, through the opening caused by said first tubular valve being moved to the open position and through said exit channel in the top portion of said second tubular valve element, and a liquid flow path being open when said second tubular valve element is in the open position and being closed when said second tubular valve element is in the closed position, said liquid flow path being through said liquid inlet, through the opening caused by said second tubular valve being moved to the open position and through said exit channel in the top portion of said second tubular valve element.

3,985,157

ADJUSTABLE REGULATOR VENT COVER

Robert J. Ferguson, Marshall, Mich., assignor to Progressive Dynamics, Inc., Marshall, Mich.

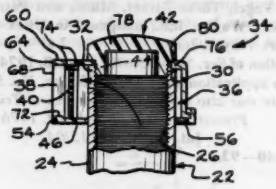
Filed May 21, 1975, Ser. No. 579,474

Int. Cl.² F16K *45/00*

U.S. Cl. 137—801 **15 Claims**

1. A gas pressure regulator vent cover for regulators having an internally threaded vented neck, in combination, a hollow body having inner and outer walls interconnected by a side wall, a first neck-receiving opening defined in said inner wall, a second neck-engaging opening defined in said outer wall coaxial with said first opening of a diameter slightly less than the diameter of the associated regulator neck, a vent opening defined in said side wall, and a cap having a threaded stem

receivable within said second opening and a lip concentric to said stem of a diameter greater than the diameter of said



second opening adapted to engage said outer wall adjacent said second opening.

3,985,158

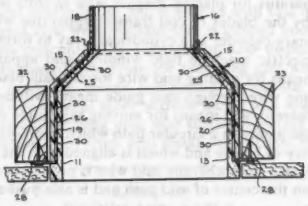
BOX FOR MOUNTING DIFFUSERS

John V. Felter, 1307 Ashland, Houston, Tex. 77008

Filed May 28, 1974, Ser. No. 473,891

Int. Cl.² F16L *9/12, 9/14*

U.S. Cl. 138—149 **10 Claims**



1. Box apparatus for mounting a diffuser, comprising an integral molded box formed of insulating material and having a first opening for connection to a duct and having a second opening for receiving a diffuser thereover, a sleeve adapted for telescopic engagement with a duct at one of its ends and having its other end imbedded in said molded insulating material around the edge of said first opening, and a horizontal flange having its inner portion imbedded in said molded insulating material adjacent said second opening and having its outer portion extending outward of said molded box adapted for connection to a building structure to support said box apparatus.

3,985,159

HEDDLE TRANSFER APPARATUS AND METHOD FOR TRIAXIAL WEAVING MACHINE

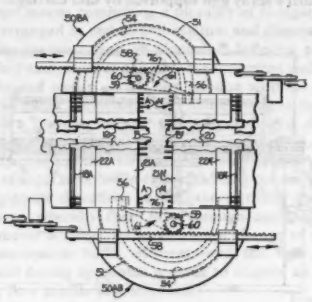
Franklin L. Townsend, and Frank P. Trumpio, both of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Oct. 7, 1975, Ser. No. 620,332

Int. Cl.² D03D *41/00*

U.S. Cl. 139—11 **29 Claims**

1. In a weaving machine for making triaxial fabric and having a plurality of elongate heddles arranged in weftwise rows for guiding respective warp strands, and heddle transfer means for moving heddles from one end of one row to the adjacent end of another row, the improvement in said heddle transfer means which comprises stationary guide means extending from said one end of one row to said adjacent end of another row for guiding heddles moving therebetween, and mechanism for engaging heddles and for moving the same



along said guide means from said one end of one row to said adjacent end of another row.

3,985,160

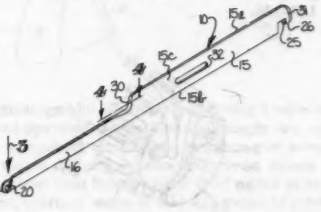
HEDDLE FOR A WEAVING MACHINE FOR MAKING TRIAXIAL FABRICS

Karol Kulczycki, Parsippany, N.J., and Burns Darsie, Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed May 30, 1975, Ser. No. 582,246

Int. Cl.² D03C *9/02*; D03D *41/00*

U.S. Cl. 139—93 **11 Claims**



1. An elongate, flat and thin heddle for a weaving machine for making triaxial fabrics wherein the heddle is adapted to be moved longitudinally during a warp shed forming operation and also is adapted to be shifted weftwise of the weaving machine, said heddle being an elongate strip material and having a nose portion with a warp strand guide opening extending therethrough, said nose portion being of a lesser thickness than at least the major portion of the heddle, said heddle having means thereon adapted to be engaged for imparting longitudinal movement thereto, and at least a medial portion of said heddle having a shoulder portion extending along one edge thereof and adapted to be engaged for shifting the heddle weftwise of the weaving machine.

3,985,161

SPRAY MACHINE

Thomas L. Nelson, Doraville, Ga., assignor to Southern Oxygen Supply Company, Atlanta, Ga.

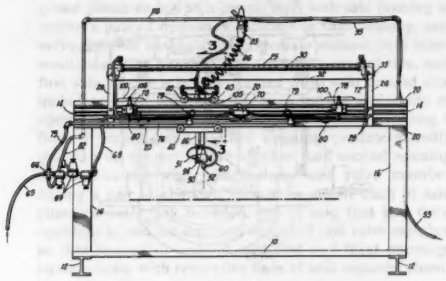
Filed Dec. 6, 1974, Ser. No. 530,362

Int. Cl.² B05B *3/18*

U.S. Cl. 239—185 **3 Claims**

1. A spray machine comprising a frame having a pair of laterally spaced beams; a first pair of rails mounted to and supported one above the other by one of said frame beams; a second pair of rails mounted to and supported one above the

other by another of said frame beams; a carriage movably supported between said first and second pairs of rails and having at least one wheel in rotatable engagement with each of said rails; a spray gun supported by said carriage; means for



reciprocally driving said carriage along said rails; a channel secured to at least one of said beams; and actuator means mounted to said channel adjacent opposite ends of said first and second pairs of rails for controlling said carriage driving means.

3,985,162

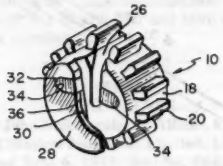
KNOTTING GEAR

Howard E. Redman, Duxbury, Mass., assignor to Mathewson Corporation, Quincy, Mass.

Filed May 9, 1975, Ser. No. 576,129

Int. Cl.² B21F *15/04*

U.S. Cl. 140—36 **1 Claim**



1. A rotary knotting head for use in a wire tying machine comprising, a cylindrical body having external axially aligned concentric bearing surfaces, an axially disposed wire receiving bore, a radially extending slot in communication with said bore and at one end an integral segmental extension providing at that end along one side of the end face a transverse wire wrap surface extending across said end face spaced from said bore at one side of the slot, said segmental extension containing a U-shaped recess which opens to the wrap surface and said cylindrical body containing a U-shaped recess open to the surface of the slot opposite the recess in the segmental extension, said recesses being axially offset such that the inner end of the recess in the segmental extension lies in the plane of the outer end of the recess in the cylindrical body and a hard wear resistant part fixed in each recess, said parts having flat bearing surfaces which coincide with the wrap surface and said surface of the slot and said recesses being tilted relative to each other such that their center lines intersect at a point above the bottom of the slot and said bearing surfaces diverge, said parts being totally confined within the recesses except for the flat bearing surfaces exposed at the open sides of the recesses so that the reactive pressures developed during winding are transferred from the bearing surfaces to the cylindrical body and segmental extension thereof.

3,985,163

APPARATUS AND METHOD FOR FORMING CIRCULAR DYNAMOELECTRIC MACHINE FIELD WINDINGS BY PUSHING

Ralph A. Vogel, Three Rivers, Mich., and Patrick L. Grawcock, Fort Wayne, Ind., assignors to Essex International, Inc., Fort Wayne, Ind.

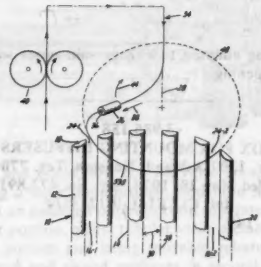
Continuation of Ser. No. 473,679, May 28, 1974, abandoned.

This application June 25, 1975, Ser. No. 590,158

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² H02K *15/04*

U.S. Cl. 140—92.1 **6 Claims**



1. Apparatus for placing magnet wire in slots respectively defined by the blades of coil transfer apparatus which lie on an imaginary cylinder in a cylindrical array to form a circular dynamoelectric machine field winding, said apparatus comprising means for guiding said wire toward said blades, means for pushing wire through said guide means without applying tension thereto, and means for moving said guide means relative to said blades in a circular path which overlaps said cylindrical array of blades and which is aligned with the open ends of two or said slots whereby said wire is pushed in a direction away from the center of said path and is also pushed into said two slots.

3,985,164

APPARATUS AND METHOD FOR FORMING CIRCULAR DYNAMOELECTRIC MACHINE FIELD WINDINGS BY PUSHING

Patrick L. Grawcock, Fort Wayne, Ind., assignor to Essex International, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 473,679, May 28, 1974, abandoned.

This application June 25, 1975, Ser. No. 590,159

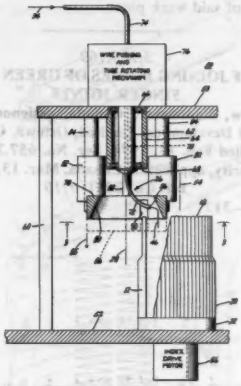
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² H02K *15/04*

U.S. Cl. 140—92.1 **4 Claims**

1. Apparatus for placing magnet wire in slots respectively defined by the blades of coil transfer apparatus which lie on an imaginary cylinder in a cylindrical array to form a circular dynamoelectric machine field winding, said apparatus comprising means for guiding said wire toward said blades, means for pushing wire through said guide means without applying tension thereto, and means for moving said guide means relative to said blades in a circular path which overlaps said cylindrical array of blades and which is aligned with the open ends of two of said slots whereby said wire is pushed in a direction away from the center of said path and is also pushed into said two slots; said blades respectively having distal ends and proximal ends mounted on a support member, said slots having open ends defined by said distal ends, said cylinder having a first axis, said guide means including a gun member having a dispensing end spaced from and extending generally radially with respect to a second axis which is spaced from said cylinder and parallel with said first axis, said dispensing end lying

in a plane spaced from said distal ends on the side thereof remote from said support member, said moving means including means for rotating said dispensing end about said second axis whereby said dispensing end pushes said wire in said circular path, the spacing of said dispensing end from said second axis and the ratio of the speeds of said pushing and moving means being proportioned and arranged so that said



path overlaps said cylinder and is aligned with said open ends of two of said slots whereby said wire is pushed into said two slots; means concentrically surrounding said dispensing end and radially spaced therefrom for confining said wire in said path; said confining means comprising an annular member having a frusto-conical inner surface facing and spaced radially from said dispensing end, said surface tapering inwardly in the direction away from said distal ends of said blades.

3,985,165

DOSING APPARATUS

Menachem Tamir, Buffalo Grove; Manuel I. Martin, Hoffman Estates, both of Ill., and Robert J. Magill, San Jose, Calif., assignors to G. D. Searle & Co., Skokie, Ill.

Filed July 11, 1975, Ser. No. 594,984

Int. Cl.[2] B65B *29/00*; B67D *5/60*

U.S. Cl. 141—21 **11 Claims**

1. A dosing apparatus comprising an elongated tubular member connected at one end to a reversible pump for imparting controlled reverse flow of a first fluid within the tubular member during aspirating and dispensing of a second fluid through the opposite end of said member, and means disposed within said member for inhibiting intermixing of the fluids therein; said means comprising a plurality of elongated baffle elements arranged in end-to-end relation and disposed within said tubular member, and an elongated deflector piece disposed within said member adjacent the aspirating and dispensing end thereof and in end-to-end relation with the endmost one of said baffle elements; each baffle element being provided with a plurality of symmetrically arranged outwardly extending elongated vanes having the outer edge portions thereof adjacent the interior surface of said tubular member, the vanes of successive baffle elements being curved longitudinally in opposite directions through arcs greater than about sixty degrees whereby fluid flow through said plurality of baffle elements is subjected to an abrupt change of direction at each successive baffle element, and the flow of fluid through said dosing apparatus is made to acquire an approximate plug flow profile characteristic.

3,985,166

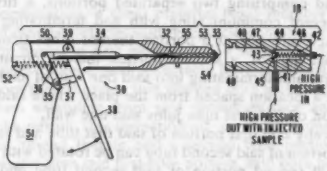
HIGH-PRESSURE SAMPLE INJECTION FOR LIQUID CHROMATOGRAPHY

Richard E. Klee, 1499 Sierra Ave., Napa, Calif. 94558

Filed June 2, 1975, Ser. No. 582,969

Int. Cl.[2] G01N *1/00*; B65B *37/06*

U.S. Cl. 141—346 **9 Claims**



1. Chromatography apparatus comprising a valve structure and a hand-operable sample-fluid delivery device; said valve structure comprising sample-fluid entrance port means, internal wall means defining a passageway for a stream of high-pressure carrier fluid from a carrier-fluid source to an analysis instrument, aperture means in said wall means to provide fluid communication between said sample-fluid entrance port means and said carrier-fluid passageway, and check-valve means being operable to admit sample fluid from said sample-fluid entrance port means into said carrier-fluid passageway only when the pressure of said sample fluid is at least as high as the pressure of the carrier-fluid in said passageway; and said sample fluid delivery device comprising exit port means configured to engage in leak-tight fluid communication with said sample-fluid entrance port means of said valve structure.

3,985,167

ROTATABLE DUAL HOSE ASSEMBLY

Perry Roque, Pacifica, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 23, 1975, Ser. No. 624,752

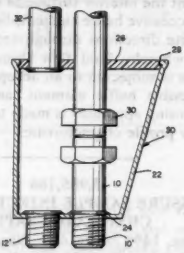
Int. Cl.[2] B65B *1/04*

U.S. Cl. 141—392 **5 Claims**

1. A rotatable dual hose arrangement for conveying two respective fluids independently, comprising:

a first tube comprising an elongated cylinder with walls which are relatively thin in relation to the bore of said tube and having a rotary coupling therein for enabling a first portion of said tube on one side of said coupling to be rotated with respect to a second portion of said tube on the other side of said coupling while enabling fluid to be conveyed in said tube without loss thereof,

an enclosure box mounted about the portion of said first tube containing said rotary coupling, said enclosure box having relatively thin walls with respect to the inside dimensions of said box, said walls substantially completely surrounding said rotary coupling, said box, except for one wall thereof, being fixed to said second portion of said first tube, said one wall thereof comprising a circular member which is substantially flat, said one wall being fixed to said first portion of said first tube and being rotatably mounted with respect to said enclosure box and said second portion of said first tube,



a second tube comprising an elongated cylinder having relatively thin walls with respect to the bore of said tube and comprising two separated portions, a first portion thereof communicating with and terminating into said enclosure box at a portion thereof other than said one wall thereof, a second portion thereof communicating with and terminating into said one wall of enclosure box at a location spaced from the place where said first portion of said first tube joins said one wall,

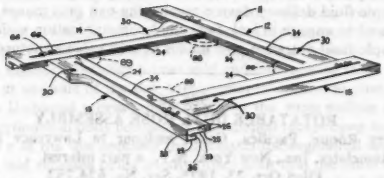
whereby said first portion of said first tube and said second portion of said second tube can be rotated with respect to said second portion of said second tube and said first portion of said second tube while said first and second tubes can convey first and second fluids independently.

3,985,168

ADJUSTABLE ROUTING TEMPLATE

Ray Arnold Lundquist, 2571 - 24th Ave. N., St. Petersburg, Fla. 33713

Filed Oct. 20, 1975, Ser. No. 623,942
Int. Cl.² B27C *5/00;* **B23Q** *15/00*
U.S. Cl. 144—144.5 GT **7 Claims**



1. An adjustable routing template for use in guiding a cutting tool, such as a router, for the routing of grooves, steps, ledges and the like in a work piece, such as a cabinet door, the template comprising, in combination:

a set of four substantially identically constructed longitudinally elongated rigid bar members;

means associated with each of said bar members for adjustably slidably interconnecting adjacentmost ones of said bar members to define said templates;

a plurality of corner guide members, each guide member removably insertable into a corner defined between adjacentmost bar members for defining ornamental configurations to be routed with the template; and

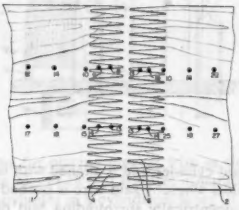
a plurality of corner stop members, each stop member removably insertable into a corner of said template in a manner not interfering with the placement of said corner guide members, each stop member adapted to engage a corner of a work piece to be routed for securely mounting said template in an overlapping manner on said work piece with said corner stop members engaging corner portions of said work piece.

3,985,169

METHOD OF JOINING BODIES OF GREEN LUMBER BY FINGER JOINTS

Suezone Chow, Vancouver, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Feb. 11, 1976, Ser. No. 657,286
Claims priority, application Canada, Mar. 13, 1975, 222000
Int. Cl.² B27D *1/10*
U.S. Cl. 144—317 **6 Claims**



1. A method of joining bodies of green lumber by finger joints, comprising:

a. forming a plurality of correspondingly interfitting jointing fingers on the lumber bodies,

b. heating and drying the lumber bodies at a temperature greater than 59° C until the jointing fingers only are dried to a moisture content of less than 50 percent oven dry basis.

c. lowering the temperature of the interfitting jointing fingers to which a heat-curable adhesive is to be applied for jointing, to avoid precure of the adhesive while the lumber bodies are separated, while maintaining all of the jointing fingers in the dried condition,

d. coating the dried jointing fingers which are at the lower temperature, with a heat-curable adhesive for wood,

e. pressing the jointing fingers of the lumber bodies together in interfitting relationship with an end loading pressure greater than 150 psi on the cross-sectional area of the lumber bodies and,

f. maintaining the jointing fingers pressed together for a sufficient time for heat stored in the lumber bodies, from the heating and drying, to be transferred to the fingers and set and harden the heat-curable adhesive and bond the interfitting fingers to one another.

3,985,170

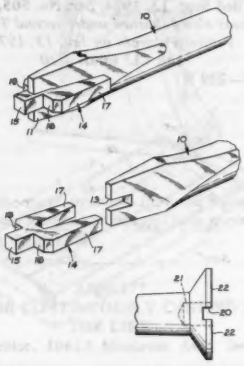
SCREWDRIVER

Marian Iskra, 20 Little Sutton Road, Four Oaks, Sutton Coldfield, West Midlands, England

Filed Aug. 4, 1975, Ser. No. 601,400
Claims priority, application United Kingdom, Aug. 17, 1974, 36294/74
Int. Cl.² B25B *15/02*
U.S. Cl. 145—50 A **4 Claims**

1. The combination of a screw having a head including a transverse parallel-sided slot and a central axial guide bore of greater depth than the slot and of a diameter greater than the width of the slot; and a screwdriver bit comprising a first

component in the form of a shank terminating in a straight-edged flat-sided diametrally extending blade tip for rotational driving engagement with said slot, said blade tip having a centered transverse edge notch, and a second component in the form of an axial insert of which at least part is rigidly secured in said transverse notch, said insert having a central guide spigot of non-circular cross section projecting axially downwardly beyond the blade tip for engagement in said axial



guide bore of the screw and a pair of buttresses extending radially outwardly from and longitudinally upwardly along said flat sides of the blade tip, said buttresses being joined to said spigot by a transverse portion extending through said notch and being formed at opposite sides of said transverse portion with downwardly facing end surfaces disposed above said blade tip for abutting the screw head at opposite sides of said slot.

3,985,171

CLUB PROTECTING COVER FOR GOLF BAG

James B. Summers, Lima, Ohio, and Robert E. Bourke, Westport, Conn., assignors to NBS, Inc., Huntsville, Ohio

Filed Sept. 2, 1975, Ser. No. 609,503

Int. Cl.² A63B *55/00*

U.S. Cl. 150—52 G **9 Claims**

1. A club protecting cover for a golf bag comprising a shell-form body fabricated from pliable sheet material having a tubular wall closed at one end and open at the other with a transverse cross-sectional configuration at the open end to closely interfit with an open top of a golf bag, said body having a peripheral edge formed to cooperatively interengage with the marginal end portion of the open top of a golf bag and a partition wall fabricated from pliable sheet material and disposed interiorly of said body and dividing said body into two axially extending compartments for receiving the head portions of golf clubs with irons and woods disposed in respective ones of said compartments, said partition wall secured along longitudinally extending sides thereof to diametrically opposed sides of the tubular wall of said body and secured at an interiorly disposed end thereof to said body, and resilient securing means interconnecting exteriorly with said body at the juncture thereof with the interiorly disposed end of said partition wall and said resilient securing means provided with attachment means positioned on the same diametrically opposed sides of said body to which said parition wall is secured, said attachment means adapted to cooperatively engage with the golf bag.

3,985,172

PANEL EXTRUDING NUT AND ASSEMBLY

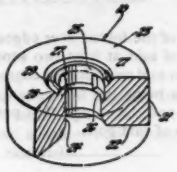
David B. Ballantyne, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 154,084, June 17, 1971, abandoned.

This application May 7, 1973, Ser. No. 357,617

Int. Cl.² F16B *39/00*

U.S. Cl. 151—41.73 **13 Claims**



1. In combination, a sheet material basal member and a panel extruding receptacle, said receptacle comprising a one-piece body having a first surface and a second surface on opposite sides thereof, said receptacle having at least a first stepped bore therethrough, said stepped bore including a first bore portion extending from said second surface and of a diameter to permit the formation of a predetermined size roll-formed thread therein and a second bore portion of a larger diameter than said first bore portion, said bore portions meeting coaxially with an intervening shoulder, an annular lip concentric with said second bore portion and extending radially inward thereof adjacent said first surface, said first surface of said receptacle being positioned against said flat basal member, an annular perforated and extruded neck extending from said basal member into said second bore portion in annular engagement with said annular lip and with the outer periphery of said neck engaged in said second bore portion, said perforated neck providing an aperture therethrough coaxial to said bore portions and of a diameter commensurate with the diameter of said first bore portion to permit the formation of a predetermined size roll-formed thread therethrough whereby during the formation of said roll-formed thread in said neck, said neck is radially deformed to effect further mechanical bonding of said neck to said receptacle within said second bore, and means preventing relative rotation between said basal member and said receptacle.

3,985,173

VEHICLE TIRE

Yves Masson, Paris, France, assignor to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, France

Filed July 11, 1974, Ser. No. 487,614

Claims priority, application France, July 11, 1973, 73.25352

Int. Cl.² B60C *9/18*

U.S. Cl. 152—361 FP **11 Claims**

1. A tire having a low profile, which comprises a reinforcing belt having a width approximately equal to the width of the bearing surface of the tire and being positioned under the tread of the tire, said belt comprising at least two superposed layers, the lateral edges of which are folded over together towards the median plane of the tire with one layer forming outer folded edges and another layer forming inner folded

edges, the outer folded edges of said one layer being wider than the inner folded edges of said another layer so as to completely enclose the folded edges of said another layer and to overlap the inner folded edges of said another layer towards the median plane of the tire to provide a tiered relationship

between the ends of the folded over edges and a central thin portion made up of said at least two superposed layers and positioned between said outer folded edges, the width of these outer folded edges being not more than one quarter of the width of the belt, and the central thin portion being at least one half the width of said belt.

3,985,174

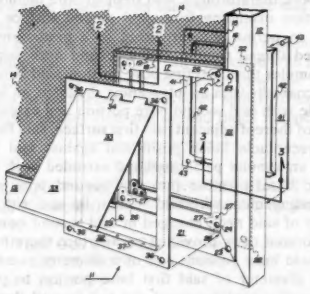
PET DOOR

Charles O. Bricker, 13861 Otis Place, Poway, Calif. 92064

Filed June 24, 1975, Ser. No. 589,756

Int. Cl.² E06B 7/28

U.S. Cl. 160—180 **1 Claim**



1. A pet door in a window screen or screen door comprising:

a window screen or screen door having a generally rectangular frame with four inner edges bordering and terminating a central screen portion;

a cut out in said screen portion of said screen door or window, said cut out having two edges forming two sides of a rectangle with portions of two inner edges of the window or door frame forming two other sides of said rectangle;

a rectangular central screen frame member having a spline groove, said two edges of said cut out being received by said spline groove;

a spline cord received by said spline groove of said screen cut out edges for holding said screen edges therein;

at least one U-shaped extension extending from at least one edge of said central screen frame member dimensioned for and receiving a portion of at least one of said inner edges and a portion of said rectangular frame;

first and second outside rectangular frame members having substantially the same dimensions as said central screen frame member coupled to said central screen frame member; and

a panel hingedly attached to one of said outside members at a top portion thereof for allowing a pet to pass through from either direction.

3,985,175

FOAM PLASTIC INJECTION MOLDING

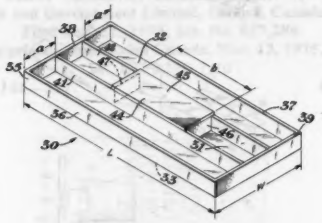
Kenneth J. Puki, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 13, 1974, Ser. No. 505,813

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² E06B 3/20

U.S. Cl. 160—229 R **7 Claims**



1. A foamed synthetic resinous plastic door, the foam plastic door having a generally rectangular configuration, the door having a finished or exposed surface and a nonexposed or hidden surface, the door having a peripheral flange portion of generally rectangular configuration extending away from and generally normal to the exposed surface, the door having first and second major edges generally oppositely disposed, the major edges being in generally parallel relationship, the door having first and second end portions generally oppositely disposed, at least first and second reinforcing members affixed to the hidden surface, the first and second reinforcing members being in generally parallel relationship, the first and second reinforcing members extending between flange portions at the first end portion and the second end portion, the reinforcing members being affixed to the nonexposed surface and adjacent flange portions, a plate-like member is disposed generally adjacent the nonexposed side and remote from the exposed side, the plate-like member affixed to and terminating at said reinforcing members at locations remote from nonexposed side and the plate-like planar member extending at least half the distance that the ribs extend, the plate-like member being generally centrally located relative to the door.

3,985,176

UNITARY PATTERN ASSEMBLY METHOD

Douglas Merrill Wamester, Bolton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 5, 1976, Ser. No. 646,805

Int. Cl.² B22C 7/02

U.S. Cl. 164—45 **10 Claims**

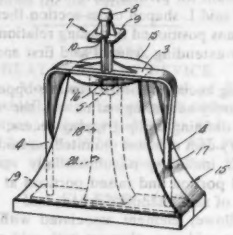
1. A method of making a unitary pattern assembly useful in forming an investment shell mold having an integral base, for the conventional and directional solidification of molten metals and alloys comprising the steps of:

a. providing a yoke, said yoke comprising a support member having two leg members extending therefrom to a distance at least equal to the length of the pattern and thickness of the base to be formed and having thereon pattern capturing means interposed between said leg members;

b. providing a mold structure, said structure having a cavity comprising a pattern section and base section;

c. positioning the mold structure and yoke to expose said pattern capturing means to the pattern section and said leg members to the base section of the cavity;

d. forming a pattern having a base integral therewith in said cavity, said pattern being fixedly captured at its end by said pattern capturing means and said base being fixedly captured by said leg members; and



e. removing the mold structure from the pattern and integral base, said pattern and integral base remaining fixedly captured in the yoke.

3,985,177

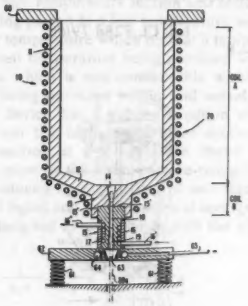
METHOD FOR CONTINUOUSLY CASTING WIRE OR THE LIKE

William J. Buehler, 10613 Montrose Ave., Bethesda, Md. 20014

Continuation of Ser. No. 788,135, Dec. 31, 1968, abandoned. This application Jan. 20, 1975, Ser. No. 542,300

Int. Cl.² B22D *27/02*

U.S. Cl. 164—51 **38 Claims**



1. A method for continuously causing molten TiNi-base alloys having of the order of 55% by weight of Ni, into relatively small wire or relatively flat ribbon shapes by the use of a graphite crucible directly adjoined by a metal die body provided with a shape-forming orifice comprising the steps of melting the alloy in the graphite crucible within a non-contaminating environment utilizing the graphite crucible as susceptor for the TiNi-base alloy, cooling at least a part of the metal die body while forcing the molten alloy through its shape-forming orifice, and continuously removing the cast alloy from the die.

3,985,178

PRECISION INVESTMENT CASTING APPARATUS WITH RESERVOIR BLOCKS

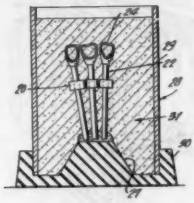
Abraham J. Cooper, Box 321, Pomona, N.Y. 10970

Filed May 1, 1975, Ser. No. 573,400

Int. Cl.² B22C *7/02*

U.S. Cl. 164—237 **7 Claims**

1. Precision investment casting apparatus for the simultaneous production of small parts comprising a plurality of transversely bored rectangular heat-destructible reservoir blocks, an elongated heat-destructible sprue pin freely receivable within each block bore, means to secure a pattern to the end of each sprue pin, means to secure each block to its



respective sprue pin at a point adjacent but spaced from the pattern, flask means including a base to receive the free ends of the sprue pins and a hollow body around the said base to receive investment material.

3,985,179

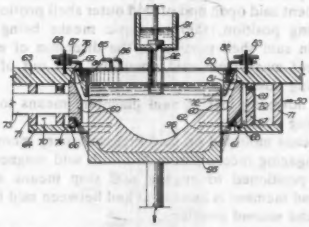
ELECTROMAGNETIC CASTING APPARATUS

David G. Goodrich, San Ramon, and Ludwig John, Pleasanton, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed July 28, 1975, Ser. No. 599,745

Int. Cl.² B22D *27/02*

U.S. Cl. 164—250 **8 Claims**

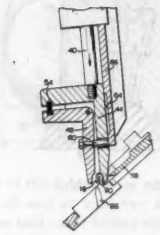


1. In an electromagnetic apparatus for the continuous or semicontinuous casting of metal ingots or billets comprising a means to feed molten metal, a ring-type metallic electromagnetic inductor means for generating electromagnetic forces which control the shape of molten metal fed from the feeding means and disposed within the inner peripheral area of the inductor means and means for cooling the shaped molten metal surfaces to solidify the molten metal in essentially the shape imposed on the molten metal by the electromagnetic forces, the improvement comprising a ring-type metallic electromagnetic inductor provided with means for generating an electromagnetic field having a flux density which diminishes in intensity toward the top of the inductor means to control the shape of the molten metal within the inner peripheral area of the inductor means so that the vertical surface or surfaces of the molten metal are essentially straight.

3,985,180
LEAD WEIGHT-MAKING APPARATUS

Jarl A. Boberg, Scarborough, Canada, assignor to A. B. Machine Company, Scarborough, Canada

Continuation-in-part of Ser. No. 431,893, Jan. 9, 1974, Pat. No. 3,916,986. This application Oct. 1, 1975, Ser. No. 618,684
Int. Cl.[2] B22D *17/24, 19/00*
U.S. Cl. 164—332 **27 Claims**



1. A clip positioning device for a lead weight-making machine comprising

a first stationary member;

a second member reciprocably movable relative to said first stationary member between a first position adjacent said first stationary member and a second position remote from said first stationary member through a predetermined intermediate position;

means associated with said first stationary member operably connected to said second member for reciprocably moving the same between said first and second positions;

said second member including a hollow elongate outer shell portion open at the end thereof remote from said first stationary member and magnetic means mounted within said shell portion;

at least part of said magnetic means normally being located adjacent said open end of said outer shell protion in a clip holding position, said magnetic means being movable within said shell portion in the direction of elongation thereof away from said open end and out of said clip holding position;

means normally biasing said magnetic means to said clip holding position;

stop means mounted on said first stationary member; and

stop engaging means associated with said magnetic means and positioned to engage said stop means when said second member is located at and between said intermediate and second positions;

said stop engaging means and said second member being constructed to move said magnetic means inwardly of said outer shell portion against said biasing when said second member is located at and between said intermediate and second positions.

5. A clip positioning device, comprising:

a stationary member,

jaw means substantially vertically reciprocably movable relative to said stationary member between an upper extremity adjacent said stationary member and a lower extremity remote from said stationary member,

means associated with said stationary member operably connected to said jaw means for reciprocably moving the same between said upper and lower extremities,

said jaw means including first and second jaw elements pivotally connected to each other solely for pivotal movement of one of said jaw elements relative to the other and normally biased to a closed position for gripping a clip therebetween,

said first jaw element being mounted to said means for reciprocably moving and having a generally L-shaped cross-section including a downwardly-extending arm and a laterally-extending arm,

said second jaw element having a generally L-shaped cross-section including a downwardly-extending arm and a laterally-extending arm and being connected to said first jaw element for pivotal movement relative thereto at the apex of said L-shaped cross-section thereof,

spring means positioned in biasing relationship between the laterally-extending arms of said first and second jaw elements,

cooperating recesses formed in the opposed faces of the downwardly-extending arms at the lower extremity thereof defining a clip-gripping recess,

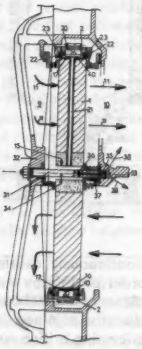
a stationary cam element mounted on said stationary member and including a substantially vertically-extending channel portion and raised portions at each vertical extremity of said channel portion, and

a cam follower element associated with said jaw means engaging said cam element with said cam follower element being positioned in said channel portion when said jaws are in said closed position and said cam follower element being positioned in engagement with one of said raised portions when said jaw means is opened by said pivotal movement of one of said jaw elements relative to the other jaw element against said biasing to a non-clip-gripping position.

3,985,181
ROTARY HEAT EXCHANGER, IN PARTICULAR FOR A GAS TURBINE

Jack Guillot, Juvisy sur Orge, France, assignor to Bennes Marrel, Zone Industrielle, Andrezieux Boutheon, France

Filed Nov. 23, 1973, Ser. No. 418,803
Claims priority, application France, Nov. 22, 1972, 72.42150
Int. Cl. F28d *19/00*
U.S. Cl. 165—8 **7 Claims**



1. A rotary heat exchanger, in particular for a gas turbine, comprising a disk of cellular ceramic material housed within a steel rim to which it is connected by driving means, and characterized in that said driving means includes means positioned between the steel rim and the periphery of the ceramic disk, which means exert a radial compression force on said periphery at all times during operation, so that at all points of the disk the ceramic material is in compression, whatever the speed of rotation and the operating pressure for the turbine may be, said means for compressing the ceramic material are constituted by an annulus of compressed air confined between the inner wall of a steel rim and the outer wall of the ceramic disk, lateral sealing means being disposed between said walls, means for connecting the annular cavity formed by the inner wall of the steel rim, the sealing means and the outer wall of

the disk with the air inlet line so that the supply of compressed air to the annular cavity thus defined is ensured from the air inlet line on which the exchanger disk is interposed, so that the value of the radial compression force on the ceramic disk varies, and adjusts itself automatically, depending on the operating conditions for the turbine.

3,985,182

HEAT TRANSFER DEVICE

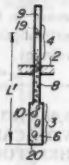
Toshitsugu Hara; Motokazu Uchida, both of Tokyo; Michio Yanadori, Hachioji, and Yasushige Kashiwabara, Musashino, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 14, 1974, Ser. No. 497,397

Claims priority, application Japan, Mar. 17, 1973, 48-91738

Int. Cl.² F28D *15/00*

U.S. Cl. 165—32 **5 Claims**



1. In a heat transfer device comprising a thermally insulated wall adapted to separate a high temperature section from a low temperature section, a vessel extending through said thermaly insulated wall, one portion of said vessel being placed in the high temperature section and another portion of said vessel being placed in a low temperature section, a liquid of low boiling temperature which boils at a temperature above a predetermined temperature being provided within said vessel, and a gas which is non-condensable within a predetermined range being provided within said vessel, whereby the heat transfer device has a valving function so that heat is transferred from the high temperature section to the low temperature section at a temperature above the predetermined temperature by the liquid surface-rising, bubble pumping action produced by the boiling of said liquid, the liquid surface of said liquid and the geometrical configuration of said vessel being designed in accordance with the equation

$$1 - C \cdot \frac{1}{\gamma_g r} \cdot \frac{A}{A_0} \cdot \frac{H}{L} < 1$$

where C is a constant, γg is the specific gravity of vapor of said liquid, r is the latent heat of said liquid, A is the area of a heating section contacting said liquid, A_o is the surface area of said liquid in contact with said gas, H is the depth of said liquid in the initial state, and L is the distance from the inner bottom surface of said vessel to the top of said thermally insulated wall.

3,985,183

GARMENT RACK SECURITY DEVICE

Francis W. Fernbaugh, 92 S. Newland Court, Lakewood, Colo. 80226

Filed May 19, 1975, Ser. No. 578,418

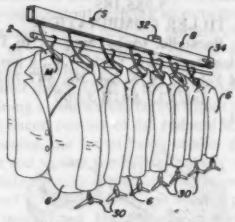
Int. Cl.² E05B *73/00*

U.S. Cl. 211—7 **19 Claims**

1. A merchandise rack security device for releasably securing a plurality of articles of merchandise to a merchandise rack, said device comprising:

a plurality of elongated members, each of which has one end attached adjacent the rack and has a terminal end extendable through a portion of an article of merchandise;

means fixedly attached to said terminal end movable between a first position for insertion of said elongated member through the article and a second position which prohibits removal of the article from said elongated member; and



means for simultaneously positioning said movable means so that all of the articles are either removable from the merchandise rack or are locked to prevent removal from the merchandise rack.

3,985,184

CULTIVATORS

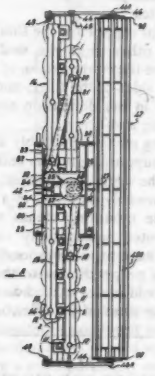
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed July 7, 1972, Ser. No. 269,756

Claims priority, application Netherlands, July 8, 1971, 7109424

Int. Cl.² A01B *33/00*

U.S. Cl. 172—53 **20 Claims**



1. A cultivator attachment comprising a frame with coupling means for connection to the rear of a prime mover and a plurality of soil-working members mounted in a row on said frame, said row extending generally transverse to the direction of travel, and a power take off connection being supported on said frame, in driving engagement with a crank mechanism, said crank mechanism being drivingly connected to reciprocate connecting rod means, and said soil-working members each being mounted on an upwardly extending shaft and having downwardly extending tine means positioned to work overlapping strips of land, said connecting rod means comprising two offset connecting rods, the shafts of said soil-working members being rotatably supported on said frame and being connected in driving engagement with the connecting rod means through respective horizontally extending arms, adjacent shafts being in driving connection through said arms to

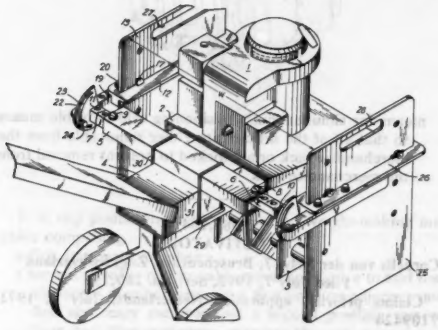
different connecting rods of said connecting rod means for rotation in opposite directions from neighboring shafts, said tine means being oscillated back and forth in arcuate paths during operation.

3,985,185

TILLER COMBINATION

Lester V. Pierce, Pocatello, Idaho, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 6, 1975, Ser. No. 547,722
Int. Cl.[2] A01B *33/00*
U.S. Cl. 172—81 **5 Claims**



1. An accessory in combination with a garden tiller having opposite sides, a width determined by the opposite sides, a center frame, and including rotary tines at the opposite sides, said accessory comprising

a pair of shield plates;

supporting means for supporting the shield plates adjustably relative to each other in height, said supporting means being mounted on the center frame of a tiller and extending beyond both sides of the tiller, said supporting means being adjustable in the dimension corresponding to the width of the tiller; and

adjustable mounting means adjustably affixed to the opposite ends of the supporting means and adjustable in position relative to the supporting means, each of said shield plates being removably mounted in a corresponding one of the adjustable mounting means whereby the shield plates are mounted substantially vertically in spaced parallel relation each at a corresponding side of the tiller and substantially perpendicular to the supporting means whereby said shield plates extend as shields at the outer extremities of the tines of the tiller.

3,985,186

PLANT GUARD FOR CULTIVATOR

Roy A. Lee, Star Route, E. Lee St., Blountsville, Ala. 35031

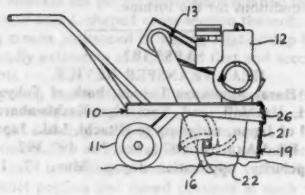
Filed Sept. 11, 1975, Ser. No. 612,563
Int. Cl.[2] A01B *33/16, 39/26*
U.S. Cl. 172—81 **9 Claims**

1. A cultivator having ground engaging cultivator elements mounted on a horizontal rotating shaft, and a plant guard mounted thereon, said plant guard comprising:

a. a generally U-shaped member as viewed in plan having a vertically extending, plate-like base member mounted forwardly of said cultivator elements and extending transversely of the direction of travel of said cultivator with the ends of said base member connected to forward ends of vertically extending, plate-like side members which extend alongside opposite ends of said shaft,

b. means pivotally connecting each said side member to the end of said shaft adjacent thereto with said base member being urged downwardly, and

c. means limiting downward movement of said base member below a predetermined elevation and permitting free



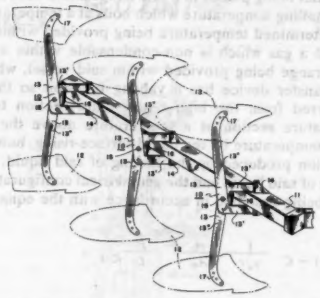
upward movement thereof so that said base member is movable to selected vertical positions to pass over obstacles in its path of movement.

3,985,187

TWO-WAY PLOW WITH CARRYING BRACKET THEREFOR

Irvin J. Callahan, 107 11th Ave. North, Nampa, Idaho 83651

Filed Nov. 26, 1975, Ser. No. 625,298
Int. Cl.[2] A01B *3/42, 61/04*
U.S. Cl. 172—224 **1 Claim**



1. A two-way plow including a pair of carrying brackets mounted on a drawbar, each bracket comprising an L-shaped shank pivotally mounted at one of its terminal ends to said drawbar and extending rearwardly therefrom, the interior vertex of said shank engaging a rest which issues sidewardly from said drawbar, said shanks being pivotally mounted to opposing sides of said drawbar and crossing past each other from one of said sides to the other at adjacently disposed vertically upstanding leg portions of said shanks, said leg portions issuing outwardly with respect to said rest, and secured together by a shear pin disposed through said adjacently disposed leg portions, a plow bottom projecting forwardly from the other terminal end of each of said shanks, the angle between the respective leg portions forming each said L-shaped shank being such that the location of the pivotal mounting of each said bracket on said drawbar is substantially vertically aligned with the plow point formed by said plow bottom.

3,985,188
EXTENSION ATTACHMENT DEVICE FOR A POWER TOOL

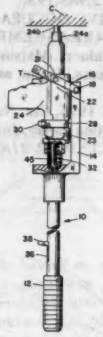
Vernon P. Steele, 22 Fairview Terrace, Glenville, Conn. 06830

Filed Apr. 11, 1975, Ser. No. 567,058

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² B23B *45/00*

U.S. Cl. 173—170 **9 Claims**



1. An extension attachment device for a power tool having an operating means and comprising an elongated pole provided with a handle at one end and an element at the other end having a pivotable member, a stationary support member provided with means for removably securing a power tool thereon, resilient means positioned between said pole and said stationary support and operatively connecting said pole and said stationary support whereby said pole is capable of linear movement upon the application of force in a predetermined direction and said pivotable member pivots to a position in which the operating means of said power tool is actuated.

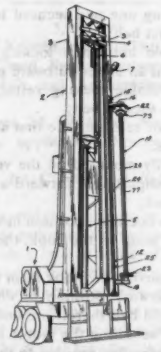
3,985,189
DRILL ROD HANDLING DEVICE

Robert H. Jahnke, Mequon, and David E. Lynch, Greendale, both of Wis., assignors to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Sept. 19, 1975, Ser. No. 614,931

Int. Cl.² E21B *19/14*

U.S. Cl. 175—52 **20 Claims**



1. In a drill rod handling device for moving a drill rod into and out of alignment with a rotary drive head to be connected thereto and disconnected therefrom in response to rotation of the head, wherein the drill rod is of the type that is cylindrical and has a holding portion of normal diameter, an axially extending reduced portion below the holding portion, and a flatted portion immediately below the holding portion that defines opposite parallel flats spaced apart a distance less than the outer diameter of the rod, a support plate comprising: a base plate having a cutout defining an outwardly facing opening at least as large as the reduced portion of the rod and at least one set of opposite, parallel straight side portions to receive the flats therebetween and hold the rod against rotation; and retainer means fixed to the upper surface of the base plate and defining an outwardly facing throat that is at least as large as the reduced portion of the rod and in alignment with the cutout opening, the throat being smaller than the holding portion of the rod so that the rod is laterally removable from the support plate through the throat and cutout opening only when it is raised to a level where the holding portion is above the retainer means and the reduced portion is vertically aligned with the support plate.

3,985,190
DAMPING OR ATTENUATION DEVICE FOR THE STOPPING OR ARRESTING ARRANGEMENT OF A SCALE

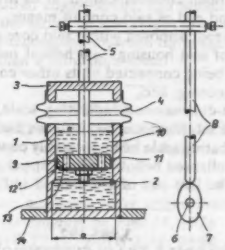
Manfred Kammerer, and Johann Tikart, both of Ebingen, Germany, assignors to August Sauter GmbH, Ebingen, Germany

Filed July 10, 1975, Ser. No. 594,854

Claims priority, application Germany, July 17, 1974, 2434289

Int. Cl.² G01G *23/08*

U.S. Cl. 177—184 **3 Claims**



1. A damping device for use in connection with the arresting arrangement of a scale apparatus,

comprising in combination

a hydraulic cylinder having a lower portion and an upper portion, the diameter of said lower portion being different in size from the diameters of said upper portion,

a piston including a rod operatively arranged in said cylinder,

cover means for said upper portion of said cylinder operable for tightly sealing said cylinder,

means adapted for coupling said piston rod with said arresting arrangement,

said piston being arranged with a clearance in said cylinder for allowing hydraulic fluid to pass around said piston,

wherein said cover means includes a flexible bellows and a cover plate,

said bellows being fixedly connected between said cylinder and said cover plate,

said piston rod being fixedly coupled to said cover plate,

said coupling means including a connecting rod substantially parallel with said piston rod,

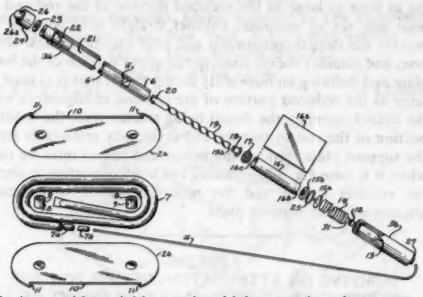
cam means operatively coupled with said connecting rod, and a switching axel fixedly coupled to said cam means and connecting said cam means to said arresting arrangements.

3,985,191

COMPACT PORTABLE WEIGHING SCALE

Lester R. Wellman, Highland Park, Ill., assignor to Barbara F. Wellman, Highland Park, Ill.

Filed Sept. 5, 1975, Ser. No. 610,548
Int. Cl.² G01G 5/04
U.S. Cl. 177—208 21 Claims



1. A portable weighing scale which comprises, in cooperative combination:

a. a weight-bearing treadle formed from two substantially parallel surfaces having a sealed, collapsible chamber therebetween;

b. conduit means in open communication, at a first end thereof, with said collapsible chamber;

c. an elongated housing having (i) a viewing aperture intermediate its ends and, (ii) a hollow core;

d. an expandable, collapsed bellows, disposed within said core at one end portion of said housing, said bellows being in open communication, at its first extremity, with the second end of said conduit means;

e. a helical rod, disposed within said core at the second end portion of said housing, said helical rod having one free end and being connected at its other end to the terminus of said housing; and,

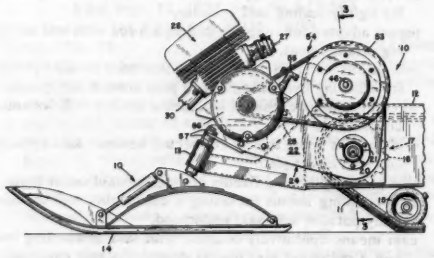
f. a weight-dimensioned indicating scale, disposed within said core intermediate said bellows and said helical rod, said indicating scale being rotatably connected at one end to said collapsed bellows, and adapted at its other end to engage the free end of said helical rod.

3,985,192

ENGINE AND DRIVE TRAIN SUSPENSION SYSTEM FOR SNOWMOBILES

Donald G. Samuelson, Anoka, and Charles A. Baxter, Minneapolis, both of Minn., assignors to Textron, Inc., Providence, R.I.

Filed Aug. 21, 1974, Ser. No. 499,171
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.² B62M 27/02
U.S. Cl. 180—5 R 15 Claims



1. In a snowmobile including a rearward track and forward ski members:

a housing enclosing said track;

a track drive member passing through said housing;

a source of mechanical energy of rotation coupled to said drive member external to said housing;

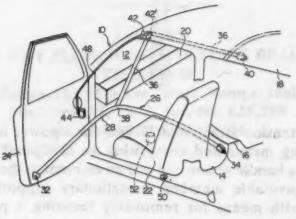
and cradle means including a pair of spaced rigid plate members resiliently mounting said source and said drive member on said housing.

3,985,193

VEHICLE SEMI-PASSIVE OCCUPANT RESTRAINING BELT ARRANGEMENT

Yoshinori Akiyama; Toshinori Matsumoto, and Katsunobu Sobajima, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed July 23, 1975, Ser. No. 598,391
Claims priority, application Japan, July 26, 1974, 49-85675
Int. Cl.² B60R 21/02
U.S. Cl. 180—82 C 3 Claims



1. In combination with a vehicle body including a floor and a roof defining an occupant compartment having a vehicle seat accessible through a vehicle door opening selectively opened and closed, a vehicle body door having a front edge pivotally secured to the vehicle body for selectively opening and closing said vehicle door opening,

a semi-passive occupant restraining belt arrangement comprising:

a first belt having one end fixed to an inboard lower rear portion of the door;

a first releasable automatic locking inertia retractor mounted adjacent a lower inboard portion of the seat, the releasable locking retractor receiving the other end of the first belt;

a second belt having one end secured to an intermediate portion of the first belt;

a second releasable automatic locking inertia retractor mounted adjacent an upper outboard portion of the seat, the second releasable locking retractor receiving the other end of the second belt;

releasable means for releasing the first and second locking inertia retractors;

a belt hanger fixedly mounted on the vehicle body within the occupant compartment forward and above the seat and having a hook,

the hook having an operative position in which if the second belt is manually hung on the hook, the hook will receive the second belt;

motor means for moving the hook from the operative position to an inoperative position in which the hook will release the second belt therefrom; and

control means for actuating the motor means to move the hook from the operative position to the inoperative position upon closure of the door with the seat occupied, the control means actuating the release means to release the first and second locking retractors during door opening and closing movements.

3,985,194

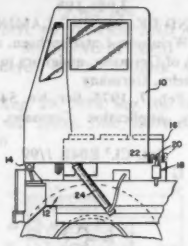
TILT CAB POWER STREAM AND VALVE CONTROL THEREFOR

Dale A. Knutson, Oconomowoc, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Aug. 30, 1974, Ser. No. 502,220

Int. Cl.² B62D *33/06*

U.S. Cl. 180—89 A **10 Claims**



1. In a motor vehicle having an elongated chassis, a cab, means pivotally mounting said cab on said chassis about an axis transverse to the longitudinal axis of said chassis, a double-acting, fluid-pressure-actuated piston and cylinder assembly having one end connected to said chassis and the other end connected to said cab for moving said cab from a normally lowered first position, to a partially raised, 45° second position, and to a fully raised, 90° forwardly tilted third position, said cab by the weight thereof urging said piston and cylinder to expand when between said second and thrid position, latch means between said chassis and cab to lock said cab in said first position, a hydraulic pump, a fluid reservoir, a directional flow control first valve, first conduit means connecting said cylinder to said first valve, second conduit means connecting said cylinder to said first valve, and third conduit means connecting said pump and said reservoir to said first valve, the improvement comprising pulsating pneumatic motor means for driving said pump, said latch means being fluid pressure actuated, fourth conduit means communicating said latch means to said first conduit means, said latch means movable from a normally closed position to an open position in response to a predetermined increase in pressure in said first conduit means, a second valve in said fourth conduit means preventing return fluid flow from said latch means when said cab is in a tilted position, and actuator means activated by said cab prior to its reaching said first position to maintain said second valve in the open position.

3,985,195

VEHICLE SPEED-LIMITING SYSTEM

Michel Tixier, St-Cloud, France, assignor to Regie Nationale des Usines Renault and Automobiles Peugeot, both of France

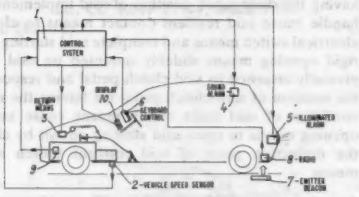
Filed Sept. 13, 1974, Ser. No. 505,943

Claims priority, application France, Sept. 20, 1973, 73.33812

Int. Cl.² B60K *41/04*

U.S. Cl. 180—98 **2 Claims**

1. In a vehicle speed-limiting system, of the type which includes over-ridable return means to raise a main speed-controlling member with a limited force of at least a predetermined amount as soon as the vehicle exceeds a predetermined speed, the improvement comprising return means associated with control means which include at least one comparator arranged to receive an actual-speed established by a sensor operable to sense the actual speed of the vehicle, and also a preset speed limit signal established by a speed limit presetting member, said comparator being arranged to supply to said return means a signal to shift said main speed-controlling member to a reduced speed position as soon as the actual speed of the vehicle exceeds a limit speed corresponding to said preset speed limit signal, and then, when the vehicle is moving at a speed between said limit and a given slower speed, said comparator preventing said main speed-controlling member from moving past the position it is occupying at the time toward a higher speed position, while below this given slower speed the comparator supplies a signal which allows said return means to be withdrawn and thus to no longer act on said main speed-controlling member, said presetting member being adjustable from within the vehicle to selectively vary said limit speed, said system including a second comparator which is arranged to receive said actual speed signal, and also



to receive a second preset speed limit signal which corresponds to said speed limit set by said presetting member plus a predetermined speed increment; including control means associated with said return means and having a third comparator which compares a signal for the actual speed of the engine of the vehicle, transmitted by sensor means to sense the speed, with a required engine-speed signal and which is capable of supplying to said return means a signal for said return means to be raised as soon as the actual speed of the engine rises above to said required engine-speed; and means which operate to cancel out the signal for said return means to be raised emitted by said third comparator, when the actual speed of the vehicle is higher than a third limit speed.

3,985,196

SINGLE SWITCH SAFETY START SYSTEM

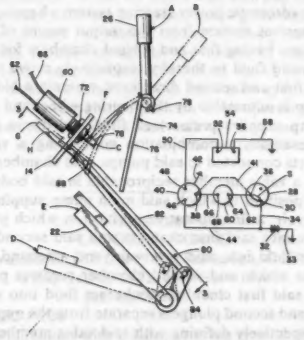
Joseph P. Deschamps, Naperville, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed July 22, 1974, Ser. No. 490,647

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² A01D *75/28;* **H01H** *3/14;* **B60K** *28/00*

U.S. Cl. 180—103 R **5 Claims**



1. For use with a lawn and garden tractor having a mobile frame with steerable wheels and traction wheels, a power source having a starting circuit mounted on said frame, a main clutch means operably connecting said power source and said traction wheels capable of selectively engaging and disengaging said operable connection by rotation of a clutch pedal, a

power implement operably connected to said mobile frame and said power source, an implement clutch means capable of selectively engaging and disengaging said implement driving connection by rotation of an implement clutch handle, a safety start system comprising, in combination:

an electrical switch means in series with said starting circuit for closing said starting circuit will be when said clutch pedal and said implement clutch handle are in the disengaged position, and for opening said starting circuit when at least one of said implement clutch handle and said clutch pedal is in the engaged position;

a resilient switch actuator means mounted on and responsive to the rotation of said implement clutch handle for having the disengaged position of said implement clutch handle cause said resilient contact means to close said electrical switch means and complete said starting circuit;

a rigid opening means slidably mounted on said tractor, pivotally attached to said clutch pedal and responsive to the rotation of said clutch pedal for having the engaged condition of said main clutch means cause said rigid opening means to open said starting circuit by changing the deflection point of said resilient switch actuator means.

3,985,197

HYDROSTATIC POWER STEERING SYSTEM

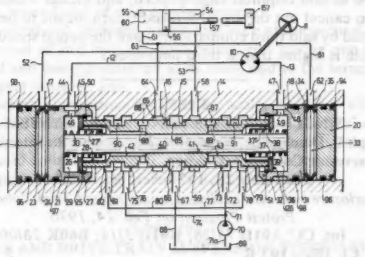
Hartmut Sandau, Moglingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 16, 1975, Ser. No. 587,434

Claims priority, application Germany, June 26, 1974, 2430575

Int. Cl.² B62D 5/06

U.S. Cl. 180—154 **11 Claims**



1. In a hydrostatic power steering system wherein a steering linkage receives motion from the output means of hydraulic motor means having first and second chambers for reception of pressurized fluid to thereby respectively move the output means in first and second directions, wherein a bidirectional pilot pump is actuatable by the steering wheel and wherein a main pump supplies pressurized fluid and draws such fluid from a reservoir, a combination comprising a valve body having ports connected to said pumps, said chambers and said reservoir; a valve member reciprocable in said body between a neutral position in which said main pump supplies fluid to said reservoir, a first operative position in which pressurized fluid flows into said first chamber and said second chamber discharges fluid into said reservoir, and a second operative position in which said second chamber receives pressurized fluid and said first chamber discharges fluid into said reservoir; first and second plungers separate from the opposite ends of and respectively defining with said valve member first and second fluid-containing compartments connected to said pilot pump so that actuation of said pilot pump in response to rotation of said steering wheel in first and second directions respectively results in fluid-induced movement of said valve member to said first and second operative positions; means for biasing said plungers to predetermined starting positions; centering springs reacting against said plungers and arranged to normally maintain said valve member in said neutral position in said starting positions of said plungers; and means for operatively connecting said plungers to each other so that a movement of one of said plungers in a direction toward the respective end of said valve member entails a similar movement of the other plunger in said last mentioned direction.

3,985,198

SOUND DEADENING LAMINATE

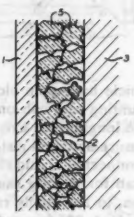
Gunther Kurtze, Weinheim-Lutzelsachsen, and Klaus Heckel, Weinheim, both of Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Feb. 7, 1975, Ser. No. 548,133

Claims priority, application Germany, Feb. 20, 1974, 2408028

Int. Cl.² E04B 1/99

U.S. Cl. 181—33 G **10 Claims**



1. A sound deadening laminate comprising a covering stratum of closed-cell soft foam having a bulk density of less than about 50 kp/m³, and a core stratum comprising closed-cell soft foam granules having a diameter of the same order of magnitude as the thickness of the covering stratum and joined to the covering stratum at locations spaced from one another by a distance less than about 10 times the thickness of the covering stratum, the total area of the joinders between the covering stratum and the core stratum being less than about ⅜ of the covering stratum area.

3,985,199

APPARATUS FOR TIMING THE FIRING OF ENERGY SOURCES

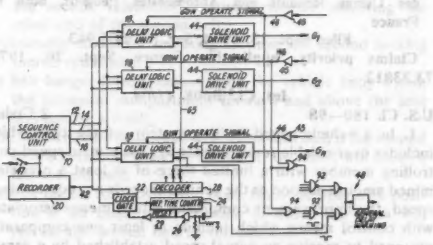
George Charles Baird, Orpington, England, assignor to Seismograph Service Corporation, Tulsa, Okla.

Filed Sept. 19, 1974, Ser. No. 507,430

Claims priority, application United Kingdom, Sept. 20, 1973, 44248/73

Int. Cl.² G01V 1/38

U.S. Cl. 181—107 **17 Claims**



1. Apparatus for affecting the firing of a number of energy sources, comprising a plurality of programmable counters adapted to initiate firing of said energy sources after programmable delays which are different for different sources, a refer-

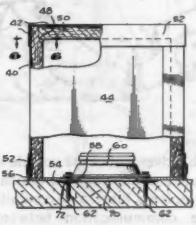
ence time counter to provide a signal indicating a desired firing time or times, for said sources, comparator means to compare the actual firing times with said desired firing time or times and means for programming said programmable counters automatically in dependance upon information received from said comparator means to bring the actual firing times to the said desired firing time or times.

3,985,200

BACKGROUND SOUND SYSTEM AND APPARATUS FOR MASKING SPEECH

Ludwig W. Sepmeyer, 1862 Comstock Ave., Los Angeles, Calif. 90025

Filed Aug. 29, 1974, Ser. No. 501,636
Int. Cl.² H05K *5/00*; A47B *81/06*
U.S. Cl. 181—150 **7 Claims**



1. An apparatus for background sound systems for masking speech in a space to be occupied by people, said apparatus comprising:

a ceiling of sound transmissive material suspended over said space;

a speaker enclosure box having a bottom wall, a speaker opening in said wall, said enclosure box being mounted on top of said ceiling so that said speaker opening is against said ceiling; and

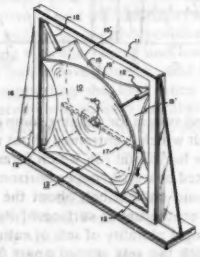
a speaker secured to said enclosure box and positioned to direct sound out of said speaker opening and into said ceiling so that the sound from said speaker is transmitted through said ceiling into said people-occupied space.

3,985,201

INFINITE SOUND REPRODUCTION CHAMBER

Glenn R. Kloster, San Dimas, Calif.

Filed Oct. 24, 1974, Ser. No. 517,552
Int. Cl.³ H04R *7/12*
U.S. Cl. 181—163 **15 Claims**



1. A sound reproduction chember, comprising:

a diaphragm enclosure including a pair of parabolic diaphragm covers disposed at a suitable distance apart and opposingly with their foci juxtapositioned in cross-sectional alignment, a frame enclosing the space between said diaphragm covers about the perimeter of said diaphragm covers; and

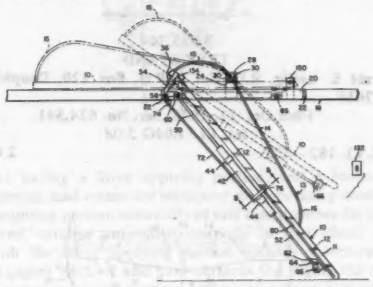
a resonating generator communicating into the interior of said diaphragm enclosure being connected directly to vibrate said diaphragm enclosure to produce sound.

3,985,202

HYDRAULICALLY OPERATED DISAPPEARING STAIRWAY

Paul V. Harmon, Nashville, Tenn., assignor to Precision Parts Corporation, Nashville, Tenn.

Filed June 23, 1975, Ser. No. 589,551
Int. Cl.² E04F *11/04*; A62B *1/06*
U.S. Cl. 182—79 **7 Claims**



1. A disappearing stairway structure comprising an open frame adapted to be mounted in a ceiling, a unitary stairway movable between an inoperative position extending from said frame to the floor below and a substantially horizontal inoperative position above and adjacent said frame, hydraulically operable means for transmitting endwise forces to said stairway, said hydraulic means comprising a pair of cylinders fixed to each other beneath the stairway, a piston in each cylinder, piston rods connected to said pistons and projecting from opposite ends of said cylinders, one of said piston rods having its free end connected to said frame and the other piston rod having its free end connected to said stairway adjacent the lower end thereof, means on which said stairway rests as it is moved between said two positions, guiding means carried by said frame, a hand rail carried by said stairway and engaging said guiding means throughout movement of said stairway between said two positions, and means for controlling said hydraulic means to relatively push said stairway in movement thereof from its inoperative position to its operative position, and for exerting a pull on said stairway endwise thereof to move said stairway from said operative to said inoperative positjon.

3,985,203

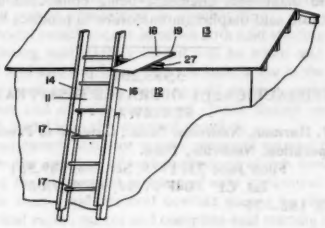
LADDER LANDING

Walter Erlenbach, 133 Curry St., Richmond, Calif. 94801

Filed Oct. 2, 1975, Ser. No. 619,023
Int. Cl.² E06C *7/14*
U.S. Cl. 182—120 **2 Claims**

1. In conjunction with a ladder having spaced side rails of channel configuration, a landing assembly comprising a support bracket having a bar member disposed within one channel of one ladder rail and extending longitudinally in a portion thereof, a support beam secured to said bar member and extending therefrom away from said one ladder rail, said support beam extending out of the plane defined by said side

rails and generally horizontally, a landing platform secured in superjacent relationship to said support beam and supported



thereby, and a tie bar extending through said bar member and said side rails to secure said landing assembly to said ladder.

3,985,204

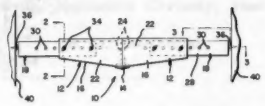
TREE STAND

Gerald E. Lattig, R.D. No. 1, P.O. Box 120, Dauphin, Pa. 17018

Filed Oct. 21, 1975, Ser. No. 624,541

Int. Cl.² E04G *5/08*

U.S. Cl. 182—223 **2 Claims**



1. A tree stand for mounting between a pair of spaced trees or the like, the stand comprising a pair of adjustable legs, each leg including channel-shaped leg and extension members nested one within the other, locking members adjustably securing the sides of the leg and extension members of each leg together so that the length of the legs may be changed as desired; a hinge joining inner ends of the leg members; and a number of tree-engaging spikes extending outwardly from the free ends of the extension members at a level above the pivot of the hinge when the tree stand is horizontally extended, the tips of the spikes on each extension member lying on a concave line extending generally across the width of the leg; whereby the stand may be positioned between the trees with the legs bent at an angle to each other, the spikes positioned adjacent the opposing surfaces of the trees and the pivot of the hinge located above the spikes and then moved to an extended position where the legs extend straight across the space between the trees with the spikes buried in the trees above the hinge pivot.

3,985,205

LUBRICATING SYSTEM

Bo Pauls Sigvald Hedlund, and Magnus Adolf Wilhelm Peter Jüllig, both of Atvidaberg, Sweden, assignors to AB ASSA, Atvidaberg, Sweden

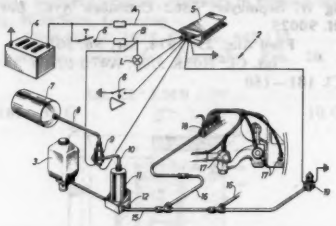
Filed Jan. 8, 1975, Ser. No. 539,531

Int. Cl.² F01M *1/00*

U.S. Cl. 184—1 E **19 Claims**

1. A method of periodically automatically applying lubricant to lubrication points of an automotive vehicle comprising the steps of manually enabling and disabling movement of the vehicle while switching electrical circuits in response to such enabling and disabling and regardless of the occurrence of any such movement, measuring intervals of time during which vehicle movement is enabled, and delivering lubricant from a reservoir to lubrication points after measurement of a predetermined interval of time during movement of the vehicle was enabled regardless of the occurrence of any such movement.

8. An automotive vehicle in which lubricant is periodically automatically applied to lubrication points thereof and comprising motive means for moving the vehicle, manually operable means operatively connected to said motive means for controllably enabling and disabling movement of the vehicle and including electrical switch means responsive to such enabling and disabling, counter means electrically connected to said switch means for measuring predetermined intervals of



time during which movement of the vehicle is enabled, regardless of the occurence of any such movement, lubricant reservoir means for supplying lubricant, conduit means for establishing operative communication between said reservoir means and lubrication points of the vehicle, and means operatively interposed in said conduit means and connected to said counter means for causing lubricant to flow from said reservoir to the lubrication points after measurement of a predetermined interval of time during which movement of the vehicle was enabled and regardless of the occurrence of any such movement.

3,985,206

AUTOMATED SYSTEM FOR A DINING ROOM OR MESS

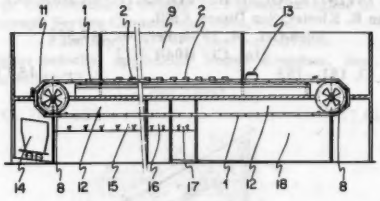
Delfos Rodriguez-Cantos, Santa Catalina, 12 2-° C, Majadahonda (Madrid), Spain

Filed May 30, 1975, Ser. No. 582,328

Claims priority, application Spain, Mar. 14, 1975, 435650

Int. Cl.² E04H *3/04*

U.S. Cl. 186—1 R **3 Claims**



1. An automated system for a dining room or mess, comprising an endless belt which is entrained about rollers so that the belt has an upper horizontal run which forms a table top and a lower run situated below the upper horizontal run, and drive means to drive said endless belt about the rollers, said belt being provided, on the upper surface of its upper run, with means for securing a plurality of sets of eating utensils to said upper surface with the sets spaced apart from one another along the upper run to define a plurality of eating positions, and the system further comprising seating means providing a plurality of seats adjacent to said upper run and spaced apart therealong to enable a plurality of persons to eat from said table top at said plurality of eating positions respectively, and washing means positioned beneath the upper run to wash said

upper surface and eating utensils secured thereto when the drive means have been operated to bring a portion of the upper run of the belt into the position of the lower run.

3,985,207

ELEVATOR BRIDGE WITH COLUMNS

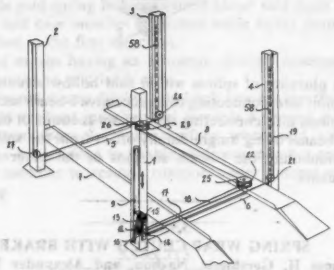
Georges Petit, St. Loup, France, assignor to Alfio Maccarone, Rueil-Malmaison, France

Filed June 12, 1975, Ser. No. 586,417

Claims priority, application France, June 13, 1974, 74.20483

Int. Cl.² B66F 7/00

U.S. Cl. 187—8.5 **10 Claims**



1. Apparatus for supporting and raising loads comprising:
at least a pair of spatially displaced upwardly extending parallel columns;
a movable horizontal support member extending between said columns;
means for imparting movement to said support member to cause said support member to move along said columns in such a manner that the end thereof are always in a common horizontal plane;
load support means positioned on said support member for receiving and supporting a load to be raised;
locking means for preventing unintentional lowering of said support member from a raised position, said locking means being carried by said support member and operatively engaging at least one of said columns;
means for releasing said locking means to permit lowering of said support member from a raised position;
vertically oriented bar means mounted from each of said columns; and
load receiving arm means mounted for movement on each of said bar means independently of movements of said support member, said arm means each being pivotal about respective of said bar means between a load engaging position and an inoperative position, said arm means not interfering with the raising and lowering of the load when in the inoperative position, said arm means being capable of supporting the load when in the operative position whereby said support member may be lowered and the load will remain in a raised position.

3,985,208

WHEEL BRAKE

Anthony C. Libhart, Waco, Tex., assignor to The Colson Company, Jonesboro, Ark.

Filed Apr. 9, 1975, Ser. No. 566,234

Int. Cl.² B60T 1/06; B60B 33/00

U.S. Cl. 188—1 D **10 Claims**

1. In a wheel mount including a wheel having a hub, a support defining opposite edges, means for mounting the wheel to the support for axially fixed, rotative movement, the improvement comprising:
a cam member having a generally U-shaped transverse cross section defining a pressure portion juxtaposed outwardly to said wheel hub, turned edge flanges engaging the support edges for permitting axially movable, nonrotative association of the cam member with the support, and opposed, oppositely inclined cam surfaces on said flanges, said cam member embracing said support with said flanges projecting to beyond said support to dispose said cam surfaces outwardly thereof; an operating member having a force applying portion, and a mounting portion; and means for mounting said operating member mounting portion outwardly of said cam member for axial fixed, rotative movement coaxially of said wheel, and with the force applying portion slidably concurrently engaging each of said cam surfaces for urging the cam member pressure portion adjustably against the wheel hub as a function of the rotational position of said operating member.

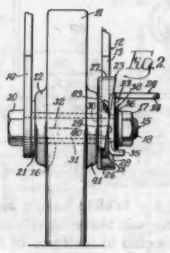


Fig. 2

3,985,209

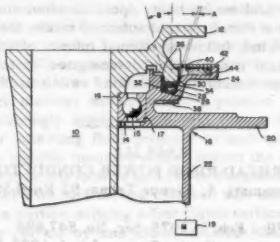
LOCK FOR DESPIN BEARING ASSEMBLY

Franklyn A. Glassow, Hawthorne, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 6, 1975, Ser. No. 584,690

Int. Cl.² F16D 63/00

U.S. Cl. 188—1 R **8 Claims**



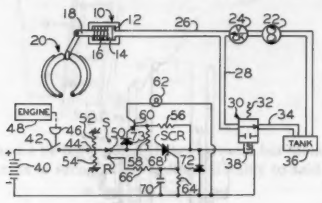
1. A bearing assembly, comprising in combination:
a stationary shaft;
a housing, circumjacent to the shaft, and coupled to the shaft to permit rotation of the housing with respect to the shaft, said shaft and housing forming a chamber therebetween; and
a metallic substance comprising gallium locking the shaft and housing to each other when the gallium is in its solid state, and releasing the housing from the shaft when the gallium is in its liquid state, so as to permit said rotation, the gallium being retained in said chamber.

3,985,210

AUTOMATICALLY ENGAGED EMERGENCY PARKING BRAKE

Norman J. Hodge, and John W. Bridwell, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 18, 1975, Ser. No. 550,322
Int. Cl.² B60T *13/68*
U.S. Cl. 188—170 **8 Claims**



1. In a system for a vehicle having an engine, a parking brake, an actuator for said brake for releasing said brake when said actuator is subjected to the force of fluid under pressure and for setting said brake when the force of said fluid is relieved from said actuator, and a two-position control valve having a first position allowing relief of fluid from said actuator and a second position blocking relief of fluid from said actuator, the improvement comprising:

a. means biasing said control valve to its first position,

b. electrically energizable solenoid means for moving said control valve to its second position against the bias of said means (a) when said solenoid means is energized,

c. a voltage source,

d. first and second switches connected in series with each other and with said voltage source and solenoid means, said first switch having open and closed positions, said second switch having "brake release" and "brake set" positions,

e. means responsive to a vehicle condition for closing said first switch when the condition exists and for opening said first switch when the condition does not exist,

f. means biasing said second switch away from its "brake release" position, said second switch being manually movable against said bias to its "brake release" position,

g. means energizable from said voltage source upon manual movement of said second switch to its "brake release" position, said means being operable when energized to maintain a circuit to said solenoid means through said second switch following manual release of said second switch, said means being de-energized in response to manual movement of said second switch to "brake set" position.

3,985,211

OVERHEAD RIGID POWER CONDUCTOR

Patrick T. Bommart, 4, Avenue Talma, 92 Rueil-Malmaison, France

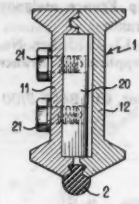
Filed Feb. 7, 1975, Ser. No. 547,888
Claims priority, application France, Jan. 6, 1975, 75.00226
Int. Cl.² B60M *1/34*
U.S. Cl. 191—25 **18 Claims**

1. A rigid power conductor of the type used to supply electric energy to electric power driven vehicles, the power conductor comprising:

a. a conductor wire defining an electrical contact adapted to be engaged by a moving electric pick-up element, said conductor having two lateral grooves,

b. at least two constant cross-section I-beams arranged in side-by-side relationship to define a hollow generally rectangular closed structure, each I-beam comprising a series of longitudinally successive I-beam sections and each I-beam having a head portion and a foot portion, the head portions of said I-beams bearing directly against each other along their facing side surfaces, the foot portions of said I-beams engaging said lateral grooves, respectively, in said conductor wire,

c. clamping means for urging said I-beams toward each other,



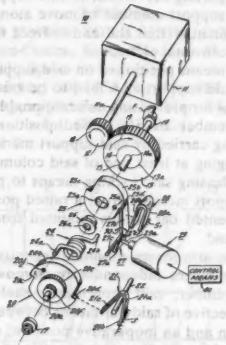
d. a plurality of splints within said hollow structure, each splint interconnecting two successive I-beam sections, the splints interconnecting the I-beam sections of one of said I-beams being longitudinally offset from the splints interconnecting the I-beam sections of the other of said I-beams.

3,985,212

SPRING WRAP CLUTCH WITH BRAKE

Abraham H. Gershnow, Nashua, and Alexander F. Vitale, Pelham, both of N.H., assignors to Centronics Data Computer Corporation, Hudson, N.H.

Filed July 24, 1974, Ser. No. 491,335
Int. Cl.² F16D *67/06, 11/02*
U.S. Cl. 192—12 BA **8 Claims**



1. A clutch assembly for selectively coupling rotary motion from a drive source to an output, said clutch assembly comprising:

a shaft continuously rotated in a first direction by said drive source;

a first gear member free-wheelingly mounted on said shaft;

a helical spring encircling and normally tightly wound about said shaft;

a first end of said spring being secured to said first gear member;

a cam member being free-wheelingly mounted upon said shaft;

the opposite end of said spring being secured to said cam member to normally couple rotation of said shaft to said cam member and said gear member;

said cam member having a cam surface including at least one shoulder;

a pivotally mounted latch arm;

a U-shaped resilient member bearing directly against said latch arm, said resilient member normally biasing said latch arm toward a first position against said cam surface whereby the free edge of said latch arm engages said shoulder to prevent rotation of said cam member and said opposite end of said spring;

said helical spring being caused to unwrap itself about said shaft when said latch arm is in said first position to prevent said cam member and said gear member from rotating;

one-way backstop means for preventing said gear member from rotating in a direction opposite said first direction to enable said spring to loosen itself about said shaft whenever said cam member is latched while freely permitting rotation in the first direction;

solenoid means having an armature directly mechanically connected to said latch arm;

said solenoid means driving said latch arm against the force of said resilient member and towards a second position displaced from said cam surface when said solenoid means is energized to enable said cam member and said gear member to resume rotation under control of said spring.

3,985,213

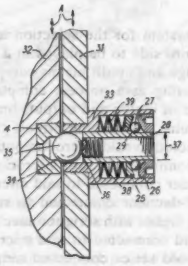
LOAD RELEASE DEVICES

George Roderick Braggins, Virginia Water, England, assignor to The Wellman Bibby Company Limited, England

Filed Nov. 7, 1974, Ser. No. 521,818

Int. Cl.² F16D 7/02

U.S. Cl. 192—56 R **8 Claims**



1. In a torque-limiting coupling comprising first and second rotary members mounted for rotation about a common axis and at least one release device spaced from said axis and interconnecting said first and second rotary members, the improvement in which said release device comprises a housing carried by said first member, plunger means mounted for movement in said housing between a projecting position and a retracted position, a seating in said second member for cooperation with said plunger means in the projecting position thereof, cooperating portions of said plunger means and said seating being shaped to cam said plunger means towards said retracted position on relative lateral movement therebetween during relative rotation of said rotary members, said plunger means having shoulder means facing away from said seating, rolling means in contact with said shoulder means, and means yieldably holding said rolling means up to said shoulder means.

3,985,214

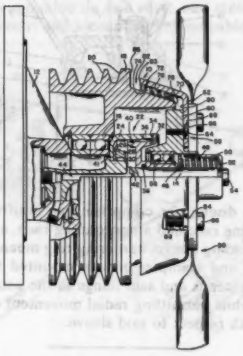
FAN CLUTCH DRIVE

John L. Hall, and Gilbert A. Pataky, both of Elyria, Ohio, assignors to The Bendix Corporation, South Bend, Ind.

Filed Dec. 4, 1974, Ser. No. 529,412

Int. Cl.² F16D 25/08

U.S. Cl. 192—91 A **5 Claims**



1. A clutched fan drive for a vehicle engine comprising a fixed spindle, a driving member, first bearing means rotatably mounting said driving member for rotation about said spindle, fluid pressure responsive ram means including means slidably mounted for axial movement on said spindle but restrained against rotation with respect thereto, a driven member, second bearing means rotatably mounting said driven member for rotation around said slidably mounted means but restraining said driven member for axial movement with said ram means, a rotatable fan carried by said driven member for movement therewith, resilient means yieldably urging said slidably mounted means in an axial direction on said spindle to urge said driven member means toward a position in which the latter is drivingly engaged with said driven member, and means for admitting fluid pressure to said ram means for urging the slidably mounted means against the opposition of said resilient means to drive said driven member out of driving engagement with said driving member, said driving member including a portion defining a first clutch surface, and a pressure plate carried by said driven member and including a radially extending portion and another portion extending from said radially extending portion, said another portion defining a second clutch surface, one of said surfaces carrying lining material for engagement with the other clutch surface when said members are drivingly engaged with one another, said first clutch surface terminating in an abutment surface, said pressure plate carrying a corresponding abutment surface, said abutment surfaces engaging one another after said lining material has worn to a predetermined thickness and said resilient means urges the driven member toward the position in which the driven member is drivingly engaged with the driven member, whereby damage to said clutch surfaces is prevented.

3,985,215
CLUTCH DISENGAGER DEVICE

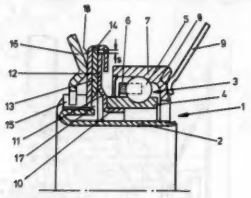
Horst M. Ernst, Eltingshausen; Manfred Brandenstein, Aschfeld, and Armin Olschewski, Schweinfurt, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Filed Dec. 6, 1974, Ser. No. 530,381

Claims priority, application Germany, Dec. 21, 1973, 7345380[U]

Int. Cl.² F16D *19/00*

U.S. Cl. 192—98 **10 Claims**



1. A clutch disengager comprising an antifriction bearing having a rotating race and a nonrotating race, a sleeve having a radially extending flange, centering ring means on said nonrotating race, and clamping means mounted to clamp said centering ring means and said flange in the axial direction of said bearing while permitting radial movement of said nonrotating race with respect to said sleeve.

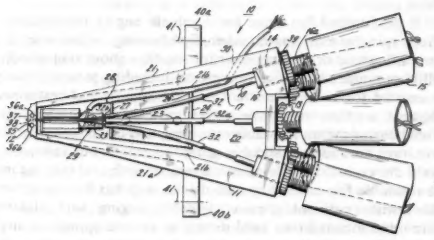
3,985,216
THERMAL PRINT HEAD ASSEMBLY

Robert McIntosh, Nashua, N.H., assignor to Centronics Data Computer Corporation, Hudson, N.H.

Filed Apr. 14, 1975, Ser. No. 567,602

Int. Cl.² B41J *3/04*

U.S. Cl. 197—1 R **10 Claims**



1. A print head assembly for use with a temperature sensitive impression material in a dot-matrix line printer, comprising:

a housing having a rear wall and a front wall joined by a pair of side walls, said housing front wall having an aperture;

a plurality of flexible elongated reciprocally mounted print wires, each print wire having a first and a second end;

bearing means maintained in said front wall for slidably supporting the first ends of said print wires and maintaining said print wires in a spaced linear fashion;

solenoid means mounted upon said rear wall and being coupled to each said print wire second end for temporarily selectively outwardly displacing each said print wire first end away from an exterior surface of said front wall upon energization of said solenoid means, said solenoid means each including spring means for returning the print wire to a rest position upon deenergization of the solenoid means;

first means positioned within said housing and between said housing front and rear walls for aligning and guiding the intermediate portions of said print wires whereby said print wires converge toward said front wall; and

means spaced from and substantially surrounding said print wires for heating the forward portion of said print wires to a predetermined temperature, whereby said print wire first end is heated by conduction and maintained at a sufficient temperature to activate said heat sensitive impression material in the event said print wire movement means is energized to move said print wire first end to momentarily impinge upon said impression material.

3,985,217
CONTROL SYSTEM FOR A COIN-OPERATED MUSICAL MACHINE

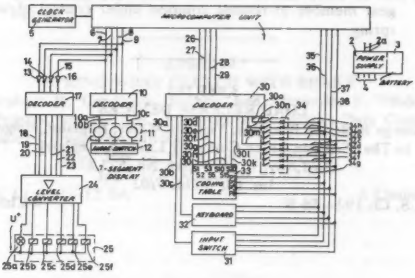
Dieter Kortenhaus, and Jürgen P. Busch, both of Bingen, Germany, assignors to NSM Apparatebau GmbH Kommanditgesellschaft, Bingen, Germany

Filed Aug. 11, 1975, Ser. No. 603,762

Claims priority, application Germany, Aug. 19, 1974, 2439675

Int. Cl.² G07F *17/00*

U.S. Cl. 194—15 **6 Claims**



1. A control system for the selection and storage of each phonograph record side to be played in a coin-operated juke box having storage and credit means comprising a microcomputer unit operating as a process computer, said computer having a number of inputs and outputs limited to a minimum by series-type runs; a switching circuit comprising a timing generator connected to said microcomputer, a BCD for 1 out of 10 decoder connected to said microcomputer, a BCD for 7-segment decoder connected to said microcomputer, a BCD for 1 out of 16 decoder connected to said microcomputer, level converting means with series connected output units and input circuits and connected to said microcomputer through said decoders, said series connected output units and input circuits comprising coding means, keyboard means, input switch means and coin switch means.

3,985,218
LOW INERTIA IMPACT PRINTING MEANS

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed May 16, 1975, Ser. No. 578,216

Int. Cl.² B41J *1/30*

U.S. Cl. 197—54 **12 Claims**

1. In a print head, a print wheel comprising in combination:

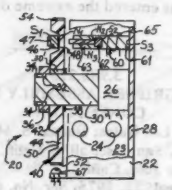
a disk having an aperture only at its center, said disk having a wall of resilient material circumjacent the aperture, said wall being in the plane of the disk and being an integral part of said disk, said wall being thinner than other portions of the disk; and

a plurality of permanently magnetized members attached to the wall, at least one of the members having a character integral therewith, said character being in a plane substantially parallel to the plane of the disk.

7. In a print head, a print wheel comprising in combination:

a disk having an aperture only at its center, wherein said disk has a plural number of sets of concentric protrusions and depressions alternating with said protrusions, said plural number of sets being of resilient material, said plural number of sets being positioned circumjacent the aperture in the plane of the disk and being an integral part of the disk; and

a plurality of permanently magnetized members, one said member per set attached to the resilient material thereof, at least one of the members having a character integral therewith, said character being in a plane substantially parallel to the plane of the disk.



3,985,219

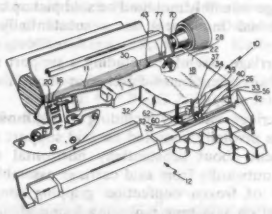
RIBBON CARTRIDGE FOR AUTOMATIC TYPEWRITER FUNCTION

Edwin J. Hurley, Cortland, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed June 23, 1975, Ser. No. 589,645

Int. Cl.² B41J *33/02, 19/62*

U.S. Cl. 197—151 **12 Claims**



1. A ribbon cartridge for a typewriter, which typewriter includes means for receiving the cartridge and operational means to perform a typewriter function for causing the alignment of a selected platen impact point relative to the typewriter print point, the cartridge comprising:

means disposed on the cartridge for actuating the typewriter operational means upon insertion of the cartridge to thereby perform the typewriter function.

3,985,220

TABULATOR APPARATUS FOR A TYPEWRITER CARRIAGE MOVING IN STEPS OF DIFFERENT LENGTH

Albert Rix, and Dieter Drogi, both of Wilhelmshaven, Germany, assignors to Olympia Werke KG, Wilhelmshaven, Germany

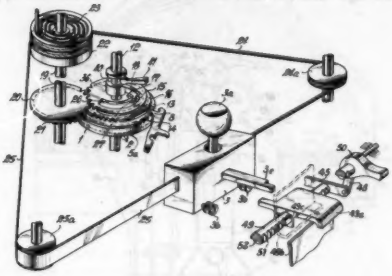
Filed Oct. 26, 1971, Ser. No. 192,370

Claims priority, application Germany, Oct. 23, 1970, 2052017

Int. Cl.² B41J *25/18, 19/58*

U.S. Cl. 197—177 **14 Claims**

1. Tabulator apparatus for a typewriter carriage moving in steps of different length, comprising carriage means movable between two end positions; two racks secured to said carriage means; drive means for moving said carriage means; escapement means including a toothed escapement member and an escapement pawl cooperating with said escapement member; tabulator means including a tab carrier mounted for longitudinal movement relative to said carriage means, and having a rack portion, said tab carrier being connected with said escapement member for movement therewith, a series of tabs mounted on said tab carrier spaced from each other a predetemined distance corresponding to the length of the steps of said escapement member, and a tabulator stop means cooperating with said tabs; and transmission means connecting said escapement member and said tab carrier with said carriage means, and including a shaft on which said escapement member is fixedly mounted, at least two different transmission gears rotatably mounted on said shaft, and meshing with said racks, respectively, and a coupling key movable on said shaft



and operable to connect one of said different transmission gears with said shaft, another gear fixed to said shaft and meshing with said rack portion, and having a guide portion coupled with said coupling key, said transmission means having a first stage in which said carriage means is controlled by said escapement means to move between said end positions in steps having the length of said predetermined distance, and a second stage in which said carriage means moves in steps having a length greater than said, predetermined distance so that said carriage means and said tab carrier more relative to each other to increase the distance between tabulating columns whereby not all tabs of said series of tabs cooperate with said tabulator stop means; and manually operated means for shifting said coupling key and thereby said transmission means between said first and second stages.

3,985,221

TUBE FEEDER WITH SELF-ADJUSTING LOADER

Willi H. Lueders, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1975, Ser. No. 625,905

Int. Cl.² B65G *47/06*

U.S. Cl. 198—474 **4 Claims**

1. A feeder having a self-adjusting loader for delivering various diameter tubes or the like, one at a time to a fixed centerline location, comprising in combination

a fixed base and a longitudinal support mounted for vertical movement thereon,

centerless roller supporting means mounted on said longitudinal support in a fixed relationship for rotatably supporting a tube or the like horizontally for rotation about its centerline which is disposed at a variable height with respect to said longitudinal support which is determined by the diameter of the tube or the like being supported,

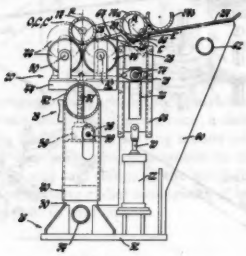
transverse track means secured to said longitudinal support and having a first portion inclined downwardly toward said centerless roller supporting means for gravity feeding tubes or the like to said centerless roller supporting means and a second portion inclined downwardly in the opposite direction,

an inclined storage rack supported in fixed relationship to said fixed base and having a lower end portion positioned adjacent said second portion of said track means whereby said second portion provides a stop for tubes or the like when such are stored on said storage rack,

lifter blade means longitudinally aligned with the second portion of said transverse track means and the lower end portion of said inclined storage rack and slidably mounted in vertical guides supported in fixed relationship to inclined storage rack,

said lifter blade means having a high point and an upper surface portion inclined downwardly therefrom in the transverse direction toward said centerless supporting means,

means for raising and lowering said lifter blade means with respect to said transverse track means and said inclined storage rack between a first position whereat said upper



surface portion of said lifter blade means is coplanar with or below said lower end portion of said storage rack and a second position whereat said upper surface portion of said lifter blade means intersects an uppermost mid portion of said transverse track means between said first and second portions, and

means for raising and lowering said longitudinal support with respect to said fixed base to adjust the height of said centerless roller supporting means to rotatably support a tube or the like of a given diameter with its centerline coincident with an imaginary horizontal centerline in fixed spatial relationship with respect to said fixed base and to concurrently adjust the height of said track means with respect to said inclined storage rack for locating a major portion of a tube or the like of said given diameter above that said upper surface portion of said lifter blade means when stored on said storage rack in abutment with said second portion of said transverse track means.

3,985,222

METHOD OF FEEDING MATERIAL TO A CONVEYOR BELT

Richard H. Kressly, Red Hill, Pa., assignor to FMC Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 391,422, Aug. 24, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 569,646

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² B65G 15/00

U.S. Cl. 198—617 **4 Claims**

1. The method of feeding material onto a conveyor belt of substantial length traversing irregular terrain and having a motor to drive the belt, said belt having vertical concave curves because of undulations and dips in the terrain, the method comprising the steps of starting the belt, feeding the material at a feed point to the belt at a reduced rate to deposit on the belt a reduced layer of material having a leading edge, increasing the feed of material to the belt to deposit a full load of material on the belt after the leading edge of the reduced layer of material has entered the extreme downstream vertical curve of the belt.

3,985,223

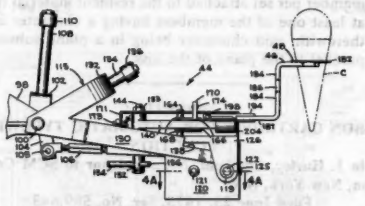
UNIVERSAL GRIPPER ASSEMBLY FOR FROZEN CONFECTIONS

Peter W. Forcella, Los Gatos; Donald S. Meek, Saratoga, and Gary D. French, San Jose, all of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Sept. 22, 1975, Ser. No. 615,879

Int. Cl.² B65G 17/42

U.S. Cl. 198—479 **11 Claims**



1. Apparatus for transferring frozen confections from a continuously moving transport conveyor to an adjacent continuously moving pickup conveyor comprising:

a. a carriage assembly mounted on said pickup conveyor for translational movement in a substantially horizontal plane;

b. said carriage assembly including a support member for pivotal movement on said conveyor about a substantially horizontal axis;

c. said carriage assembly including a tong mounting frame which is pivotally mounted on said support member for movement about substantially horizontal axis that is spaced outwardly from said carriage assembly axis;

d. a pair of frozen confection gripping tongs pivotally mounted on said tong mounting frame about pivot axes which are normal to said horizontal axes for opening and closing movement of the free ends of each tong;

e. means for pivoting said carriage assembly about its pivot axis on said pickup conveyor for lifting frozen confections from said transport conveyor; and

f. means for independently swinging said tong mounting frame about its pivot axis on said support member after the tongs have moved clear of said transport conveyor for lowering and raising the free ends of said tongs.

3,985,224

CONVEYOR BELT

George Arthur Harvey, Blakedown, England, assignor to U.M.E.C.-Boydell (Belting) Limited, Heath Town, Wolverhampton, England

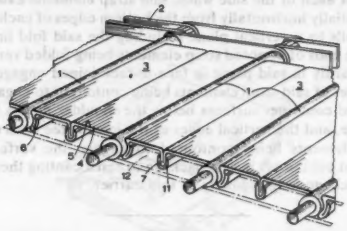
Filed Mar. 17, 1975, Ser. No. 559,001

Int. Cl.² B65G 17/06

U.S. Cl. 198—851 **9 Claims**

1. A conveyor belt comprising a series of cross rods coupled together at their ends in spaced, parallel relationship at fixed distances apart and load-bearing plate links which extend between and are supported by said cross rods, each said plate link extending between an adjacent pair of said cross rods and having a load-supporting surface and two opposite sides adja-

cent to and extending lengthwise of said cross rods, which said sides each have a longitudinal channel-shaped recess with a mouth facing in the lengthwise direction of the belt towards said adjacent cross rod and away from said opposite side of said plate link, and into which said recess a part of the periph-



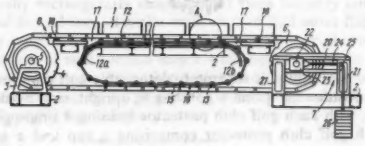
ery of the cross section of said adjacent cross rod is nestlingly and rotatably received through said mouth, said periphery part being less than half the periphery and the construction and arrangement being such that the engagement of said periphery parts of said cross rods in said recesses retains said plate links hingedly to said cross rods.

3,985,225

CHAIN CONVEYOR WITH SUPPORT CHAIN

Sergei Alexeevich Baum, 1 Voikovsky proezd, 16, kv. 84; Nikolai Mikhailovich Meshkov, Shturvalnaya ulitsa, 14, kv. 12; Mikhail Georgievich Nikolaev, Khlebny pereulok, 14, kv. 16; Evgeny Yakovlevich Osipov, Zelenaya ulitsa, 21, kv. 1; Boris Alexandrovich Khaikin, 11 Parkovaya ulitsa, 10, kv. 45, all of Moscow, and Gershon Davidovich Dymov, ulitsa Respublikanskaya, 59, kv. 26, Kuibyshev, all of U.S.S.R.

Filed Mar. 5, 1975, Ser. No. 555,615
Int. Cl.² B65G *23/00*
U.S. Cl. 198—834 **2 Claims**



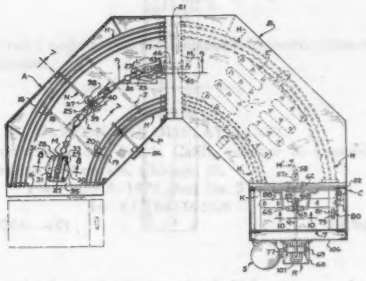
1. A chain conveyor for transporting a load, comprising: a frame having openings; a driving sprocket mounted at one end of said frame; means mounted on said frame for rotating said sprocket; a tension sprocket mounted at the opposite of said frame with respect to said driving sprocket; guides fixed to said frame between said sprockets; rollers having their rotational axes extending parallel with those of said sprockets, said rollers being pivotally interconnected, with their ends in series, so as to form an endless chain freely passing through said openings; and an endless traction chain passing around said sprockets, including links thereon, and its working run carrying the load supported by said guides through said rollers; portions of said guides surrounded by said chain being formed by said rollers, which have rounded portions; wherein each of said rollers is provided at an intermediate portion thereof with an annular projection located between said links of the traction chain.

3,985,226

ARCUATE-SHAPED MODULARS FOR A COMMERCIAL DISHWASHING MACHINE

Tore H. Noren, 3200 Lakeview Highway, Petaluma, Calif. 94952

Division of Ser. No. 286,448, Sept. 5, 1972, abandoned. This application Dec. 10, 1974, Ser. No. 531,374
Int. Cl.² B08B *3/02*
U.S. Cl. 198—738 **2 Claims**



1. In a dishwashing machine:

a. a first arcuate-shaped dishwashing modular having an entrance opening at one end and an exit opening at the other end through which dish-carrying baskets may pass;

b. a second arcuate-shaped dish-rinsing modular coupled to said first arcuate-shaped dishwashing modular with a gasket positioned between the two modulars for effecting a hermetic seal between the two modulars;

c. said second arcuate-shaped dish-rinsing modular having an entrance opening at one end and placed adjacent to the exit opening of said first arcuate-shaped dishwashing unit so that the dish-carrying baskets can pass between the two hermetically sealed modulars, said second arcuate-shaped dish-rinsing modular having an exit opening at its other end;

d. an arcuate basket-supporting and guiding stationary track extending between the two openings in each of the two arcuate-shaped modulars and providing the only support for the dish-carrying baskets as they pass through the two arcuate-shaped modulars, the space between the adjacent ends of the two arcuate-shaped tracks at the hermetically sealed junction between the two arcuate-shaped modulars being such that the baskets can freely pass from the arcuate-shaped track in said first modular onto the arcuate-shaped track in said second modular;

e. stepwise basket advancing means in each arcuate-shaped modular and including an arcuate-shaped reciprocating bar having basket engaging pawls, said bars being reciprocably mounted in each arcuate-shaped modular for causing said pawls to stepwise engage the baskets in the modulars for moving the baskets through both modulars only when said arcuate bars are moving toward the exit ends of both modulars;

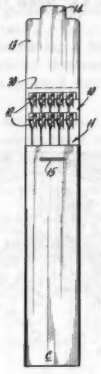
f. adjustable coupling means interconnecting the adjacent ends of the two arcuate-shaped bars and being removable from said bars to permit the separation of the modulars; and

g. means for reciprocating the two arcuate-shaped bars as a unit.

3,985,227
PACKAGE FOR ARMED SUTURES

Eberhard Thyen, Middlesex, and Peter Komarnycky, Raritan, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Nov. 5, 1975, Ser. No. 629,472
Int. Cl.[2] A61L *17/02*
U.S. Cl. 206—63.3 16 Claims

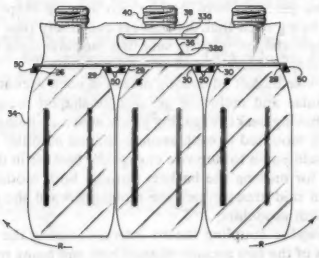


1. A one-piece folded suture package comprising a front panel, a first inner panel, a second inner panel and a back panel, said first and second inner panels having needle mounting means at the upper end thereof and suture strand retaining means at the lower end thereof corresponding in number to said needle mounting means, said first inner panel extending above the top of said front panel to expose said needle mounting means of said first inner panel, said second inner panel extending above the top of said first inner panel to expose said needle mounting means of said second inner panel, at least one armed suture comprising a suture strand having at least one needle affixed to an end thereof mounted on each of said inner panels with the needles of said sutures mounted on said needle mounting means and the strands of said sutures secured by said suture strand retaining means, and means for securing said package in said folded construction.

3,985,228
BOTTLE CARRIER

Mindaugas Julius Klygis, Barrington, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed July 14, 1975, Ser. No. 595,944
Int. Cl.[2] B65D *75/00*; B66C *1/10*
U.S. Cl. 206—158 9 Claims

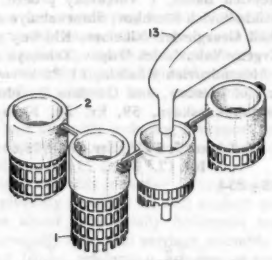


1. A package of a linear array of closely spaced bottles or like containers each having a reduced neck portion receiving a closure cap and presenting annular outward shoulder means below the upper extremity of the neck portion, and including a sheet plastic carrier having a pair of side walls diverging downwardly from a longitudinal apical fold line which is interrupted by spaced openings with at least opposite edge portions thereof in supporting underlying engagement with the shoulder means of inserted container neck portions, and strap elements integrally formed on and spaced along the bottom edges of each of the side walls, said strap elements extending substantially horizontally from the bottom edges of each of the side walls to a vertical plane including the said fold line and the free ends of opposed strap elements being folded vertically downwardly in said plane in face-to-face joined engagement, the edges of said strap elements being contoured to engage the included container surfaces below the shoulder means in said package, and the vertical edges of the joined free ends of said strap elements being contoured to engage the surfaces of adjacent containers in said package to resist canting thereof in said package longitudinally of said carrier.

3,985,229
DETACHABLY INTERLINKED REINFORCED TUBULAR GOLF CLUB PROTECTORS

Isao Maki, Taira, Japan, assignor to Takiron Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 407,759, Oct. 18, 1973, abandoned. This application Jan. 21, 1976, Ser. No. 651,017
Claims priority, application Japan, Oct. 19, 1972, 47-120103[U]; Feb. 28, 1973, 48-24670[U]
Int. Cl.[2] A63D *57/00*
U.S. Cl. 206—315 R 10 Claims

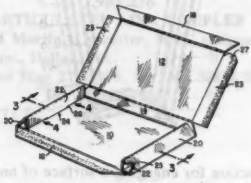


1. A plurality of separately detachable golf club protectors for positioning within a golf bag in upright, side-by-side fashion, with each golf club protector housing a single golf club; each golf club protector comprising a cap and a golf club protector body, said golf club body comprising an elongated, thin wall, light weight, synthetic resin cylinder of a diameter slightly larger than the diameter of the shaft of the golf club insertably carried therein, said cap including a cap body of an elastic material and being composed of spaced, coaxial cylindrical inner and outer walls, one end of said cap body being blocked to form a one end open annular space therebetween, each golf club protector body being of a thickness greater than the radial width of the annular space and having one end forcibly insertably received within said annular space of said cap body such that the inner and outer walls of said cap body embrace the end of the cylindrical golf club protector body to mechanically reinforce the same and protect the golf club protector body from damage during insertion and removal of its golf club, each cap body including joint parts projecting radially from said outer wall at circumferentially disposed positions and being integral therewith, and a joint member detachably interengagably linking said joint part of one of said protector cap bodies to a joint part of another protector cap body.

3,985,230
CARTON

Melvin H. Meyer, Maywood, and Gerald Gordon Weitzel, Oaklawn, both of Ill., assignors to Stone Container Corporation, Chicago, Ill.

Filed July 24, 1975, Ser. No. 598,712
Int. Cl.² B65D *85/30, 85/54*
U.S. Cl. 206—424 **13 Claims**



1. A cushioned shipping folder formed from a unitary blank of foldable paperboard or the like, comprising:

first and second major parallel walls and first and second minor parallel walls foldably interconnected to form a tubular structure, said first and second major parallel walls being rectangular in shape, said first major wall being greater in length than said second major wall; a closure and protecting structure for each end of said tubular structure including first and second flaps foldably connected to each other along a straight fold line extending the entire length of said first and second flaps, said first and second flaps being rectangular in shape and coextensive in length with each other and with the width or shorter dimension of said first major wall, said first flap being foldably connected to said first major parallel wall along a straight fold line extending along the entire width or shorter dimension of said first major wall, said first flap being folded obliquely with respect to said first major wall, said second flap being folded to a position generally perpendicular to said first major wall, said first flap, said second flap and a portion of said first major wall forming a uniformly shaped triangular air cushion extending across the entire width of said first major wall, a pair of generally rectangularly shaped outer flaps foldably connected to said second major wall, each of said outer flaps being coextensive in length with the width or shorter dimension of said second major wall, being folded to a position in facing relationship with said obliquely extending first flap and being glued to said obliquely extending first flap in a flat oblique plane.

3,985,231
APPARATUS FOR TRANSPORTING STORING AND DISPENSING FRANGIBLE MATERIAL

David L. Farhat, Dearborn Heights, and Richard S. Reihm, Pleasant Ridge, both of Mich., assignors to Container Systems Corporation, Dearborn Heights, Mich.

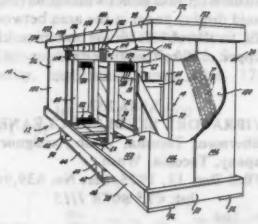
Filed Mar. 31, 1975, Ser. No. 563,593
Int. Cl.² B65D *85/48, 81/02, 85/30*
U.S. Cl. 206—448 **41 Claims**

1. In an apparatus for transporting and storing frangible glass plates or the like,

a compressible element defining at least part of a plate edge receiving recess,

guideway means arranged at generally right angles to said recess for supporting the element whereby portions thereof defining said recess are movable to and from a position compressingly engaging the opposite sides of a plate edge inserted into said recess, and

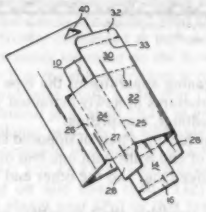
means for causing said element to move along said guideway means and thereby compressingly engage a plate edge disposed within said recess so as to support, constrain and suspend said plate against movement within the apparatus.



3,985,232
CARTON AND DISPLAY PANEL

Fred J. Johnson, Long Beach, Calif., assignor to Container Corporation of America, Chicago, Ill.

Filed May 5, 1975, Ser. No. 574,386
Int. Cl.² B65D *5/08*
U.S. Cl. 206—461 **1 Claim**



1. A collapsible, combination folding carton and display panel formed from a unitary blank of foldable paperboard or the like, comprising:

a. a flat display panel including:
   i. a rear section;
   ii. a front section foldably connected at one side edge to one side edge of said rear section and disposed to overlie said rear section in face-to-face contact therewith;
   iii. said front section having a portion cut away therefrom to expose a related portion of said rear section;

b. a tubular carton including:
   i. a pair of opposed outboard and inboard side walls;
   ii. a front wall foldably connected at opposite side edges to front edges of said side walls and being spaced directly above said exposed portion of said panel rear section, which rear section portion also serves as a rear wall of said carton;
   iii. said outboard side wall being foldably connected at its rear edge to the other side edge of said panel rear section;
   iv. means for closing the upper and lower ends of said carton after said carton has been affixed to said display panel, including an upper closure flap foldably connected to the carton front wall upper edge;
   v. said upper closure flap including a tuck tab foldably connected thereto and adapted to be inserted into said carton adjacent said panel rear section exposed portion;

c. a relatively narrow, elongated carton retaining flap foldably connected at one side edge to the rear edge of said carton inboard side wall;

d. said retaining flap being sandwiched between and secured to said panel front and rear sections inboardly adjacent said carton inboard side wall to retain said carton in position on said panel without having any obstruction on said display panel in the area between said carton side walls to thereby facilitate machine closing of said carton upper closure flap tuck tab.

3,985,233

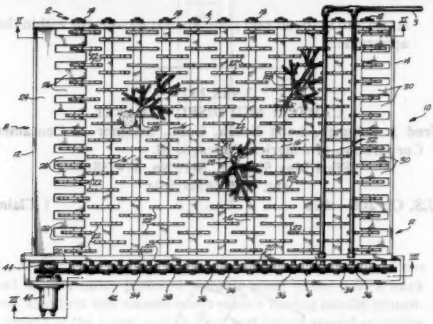
VIBRATORY SEEDLING CLEANER

Charles A. Sherman, Tacoma, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Dec. 11, 1975, Ser. No. 639,949

Int. Cl.² B07B *1/15*

U.S. Cl. 209—104 **9 Claims**



1. A plant cleaning apparatus of the type for removing soil from the root structures of newly extracted young plants such as evergreen seedlings, comprising:

a frame means having a pair of opposed side walls together with a pair of end walls with one end of the frame means being the infeed end and the other end being the outfeed end,

a plurality of rotatable shaft members extending laterally between the opposed side walls and substantially evenly spaced in a common plane between the pair of end walls,

a plurality of agitating cams eccentrically mounted on the shaft members with each cam on the same shaft being turned with respect to the next adjacent cam so its top surface is vertically displaced from the adjacent cams and having cams on adjacent shafts meshing with one another whereby an undulating conveying surface is formed with free spaces defined between adjacent cams for the passage of soil therethrough, and

means to rotate the shaft members and thereby the agitating cams in a direction that will convey the plants from the infeed end to the outfeed end.

3,985,234

TELESCOPIC BOOM FOR A CRANE

Maurice Jouffray, Bron, France, assignor to Creusot-Loire, Paris, Cedex, France

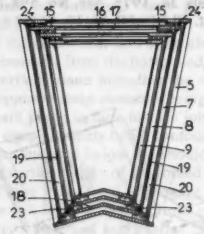
Filed Dec. 16, 1974, Ser. No. 533,442

Claims priority, application France, Dec. 20, 1973, 73.45787

Int. Cl.² B66C *23/62*

U.S. Cl. 212—144 **6 Claims**

1. A telescopic boom of a crane for lifting a load, comprising: a base element for support on a turret of the crane; a plurality of telescopic elements slidably engaged with one another and with said base element, said telescopic elements having a configuration of a five sided polygonal in cross-section with the general outer appearance of an isosceles trapezoid, each element having a substantially horizontal upper section, inwardly tapering walls, a branched base section including two legs forming an obtuse angle of an inverted V-shape, means connecting said walls to said base and upper section, said walls extending perpendicularly to the respective leg of said base section, first guide means mounted on said



horizontal section for engaging a surface of an adjacent telescopic element, and second guide means mounted on each leg of the base of the respective inner element relative to said base element.

3,985,235

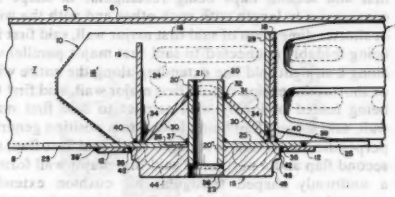
CENTER FILLER, CENTER PLATE CONSTRUCTION FOR RAILWAY VEHICLES

Richard S. Buzza, Pittsburgh, Pa., assignor to Pittsburgh Forgings Company, Coraopolis, Pa.

Filed June 17, 1975, Ser. No. 587,551

Int. Cl.² B61F *5/16*

U.S. Cl. 213—57 **9 Claims**



1. A center filler and center plate construction for the center sill and body bolster of a railway car, said center sill of the type having an open bottom and a closed top and a pair of spaced apart sidewalls depending downwardly from the top, each of the sidewalls carry an outwardly extending lateral flange on the lower edge thereof, said construction comprising:

A. a center filler including a first pair of upstanding, longitudinal walls spaced apart a distance substantially equal to the spacing between the sidewalls of the center sill, a second pair of upstanding, transverse walls extending between said first pair, a floor plate secured to the lower edges of said first and second pairs of walls to define a box shaped structure, said floor plate having a hole formed therethrough, a king pin tube secured within said hole and having an upper end positioned within the box shaped structure and a lower end spaced beyond the floor plate, said center filler secured within the center sill with the floor plate positioned flush with the flanges of the center sill;

B. a center plate including an outwardly extending, circular bowl portion having a central hole formed therethrough to receive the lower end of the king pin tube therein, upper edge portions of the center plate contacting the flanges of the center sill and the floor plate of the center filler, and means for securing said upper edge portions of the center plate to the center sill and center filler; and

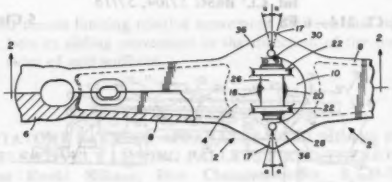
C. plate means secured within the box shaped structure for bracing said center filler and including a unitary plate member bent at an angle of about 90° and having a hole formed therethough at the bend line to receive the upper end of the king pin tube, said plate member secured by welding around said hole to the king pin tube and also secured by welding at its edge to portions of the center filler.

3,985,236

ARTICULATED LINK COUPLER

Albert Edward Martin, Lancaster, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 27, 1975, Ser. No. 580,638
Int. Cl.² B61G 1/28
U.S. Cl. 213—75 R 19 Claims



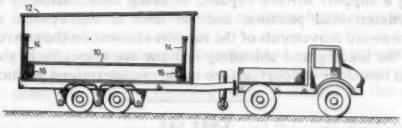
1. A pair of couplers for connecting railway cars, each coupler comprising a head, having opposed longitudinal surfaces, and a butt portion connected together by a shank, the head of each coupler having alternate tenon-like projections and mortise-like depressions and being of substantially identical configuration, the projections and depressions of said coupler heads being mated together by inverting one of the pair with respect to the other, said coupler heads when mated having a common longitudinal axis.

3,985,237

DEVICE TO RAISE AND LOWER BOX-SHAPED CONSTRUCTION ELEMENTS, IN PARTICULAR PREFABRICATED GARAGES

Fritz Freudlsperger, Pallaufstr. 5a, D-8262 Neuotting, Germany

Filed Apr. 18, 1975, Ser. No. 569,475
Claims priority, application Germany, July 23, 1974, 2435369
Int. Cl.² B60P 3/14; E04H 1/04
U.S. Cl. 214—1 H 12 Claims



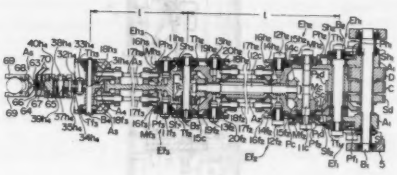
1. Device to raise and lower box-shaped construction elements, in particular prefabricated garages which exhibit at least three openings in the floor to allow passage of lifting cylinders; including a frame structure with lifting cylinders attached thereto, a lifting plate extending perpendicularly from the wall of each said cylinder to engage a shoulder in the wall of a garage; an inclined plate attached to the opposite end of said cylinder wall capable of supporting a wall of a prefabricated garage via an inserted wedge.

3,985,238

INDUSTRIAL ROBOT

Kunihiro Nakura, Ibaragi, and Takayoshi Yoshimura, Settsu, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 451,693, March 15, 1974, abandoned. This application Mar. 5, 1975, Ser. No. 555,626
Claims priority, application Japan, Mar. 17, 1973, 48-31259
Int. Cl.² B25J 3/00
U.S. Cl. 214—1 CM 9 Claims



1. An industrial robot having a multiple articulated arm mechanism, wherein at least two separate arms, or a main arm (A2) and a subsidiary arm (A3) are operable in a common plane, the industrial robot is characterized in that the main arm (A2) is fixedly connected at its base end to a second joint shaft (B2) coupled to a power unit so that the main arm is rotatable around the axis of the second joint shaft; the subsidiary arm (A3) is fixedly connected at its base end to a third joint shaft (B3) rotatably mounted on the forward end of the main arm (A2) so that the subsidiary arm is rotatable around the axis of the third joint shaft; a sun gear (Sc) is rotatably mounted on the second joint shaft (B2); in engagement with said sun gear, a planet gear (Pc) is rotatably mounted on a fixed shaft (11c) arranged in a suitably selected longitudinal position of the main arm (A2); an intermediate gear (Mc) is rotatably mounted on said fixed shaft (11c) and securedly connected to said planet gear (Pc) so that they are rotatable together; a transmission gear (Tc) fixedly mounted on said third joint shaft (B3) is operatively connected to the intermediate gear (Mc) through a connecting rod so that the second and third joint shafts (B2) and (B3) are connected to each other by way of the stretching movement epicyclic gear system (Ec) consisted of said gears (Sc, Pc, Mc and Tc); and the gear ratio among said gears (Sc, Pc, Mc and Tc) are so selected as to satisfy a relation of $(t2 \times t4)/(t1 \times t3) = 2$ (wherein, $t4$, $t3$, $t2$ and $t1$ represent the number of teeth carried on the gears Sc, Pc, Mc and Tc, respectively, in this order), so that upon transmitting power to the second joint shaft B2 to swing the main arm (A2) up or down around the axis of the second joint shaft (B2), while the subsidiary arm (A3) can be swung down or up, or swung in the opposite direction, for an equal angle in the common plane.

3,985,239

APPARATUS FOR REMOVING A HOLLOW ARTICLE FROM MANDREL

Kenneth E. Bowers, Prairie Village, Kans., assignor to Ethyl Development Corporation, Kansas City, Mo.

Filed Apr. 28, 1975, Ser. No. 571,929
Int. Cl.² B65G 47/00
U.S. Cl. 214—1 BD 5 Claims

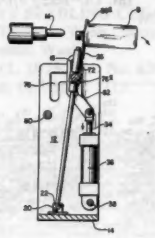
1. An apparatus for removing hollow plastic articles from a mandrel which comprises:

a. an elongated rod pivoted at one end;

b. a collar concentrically and slidably mounted on said rod and located at the end opposite said pivoted end;

c. a yoke-shaped plate for engaging said article, said plate being connected to said collar so that the center axis of said rod bisects said plate;

d. a follower means connected to said collar;
e. an elongated bifurcated arm having a left subarm and a right subarm, each of said subarms having a front portion and a back portion wherein,
i. said front portion has slot therein for receipt of said follower means,
ii. said front portion and said back portion intersect to form an obtuse angle, and



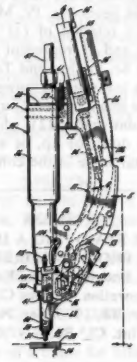
iii. said arm is pivoted at a point adjacent to said intersection, and wherein said rod is positioned between said subarms;
f. a power means communicative with said arm for imparting arcuate motion to said arm about its pivot point; and
g. a track means also for the receipt of said follower, said track having a vertical leg and a horizontal leg which legs intersect at a right angle so that, upon arcuate motion of said arm, said engaging means will move along a path to engage said bottle and to remove it from said mandrel.

3,985,240

MECHANISM FOR TRANSFERRING PARTS

Paul H. Dixon, Belvidere, Ill., assignor to Babette Dixon, trustee, Rockford, Ill.

Division of Ser. No. 517,920, Oct. 25, 1974, Pat. No. 3,929,176. This application June 6, 1975, Ser. No. 584,524
Int. Cl.² B25B *23/10*
U.S. Cl. 214—1 BB **5 Claims**



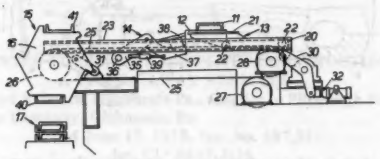
1. A transfer mechanism for moving a part from a pick-up station to a delivery station, said mechanism comprising a pair of opposed jaws movable between a closed position to hold the part and an open position to release the part, means for moving said jaws between said pick-up and delivery stations, a spring operable to bias said jaws to said closed position as said jaws are moved from said pick-up station toward said delivery station, means for releasing the spring from said jaws as said jaws move into said delivery station, means for clamping said jaws in said closed position when said spring is released and said jaws are in said delivery station, said last-mentioned means freeing said jaws for movement to said open position as said jaws begin to move out of said delivery station, and means for operably re-connecting said spring to said jaws as the latter move back into said pick-up station.

3,985,241

TRANSFER AND PILING OR STACKING MACHINE FOR LENGTHS OF FERROMAGNETIC MATERIAL

William Law Goldie, Glasgow, Scotland, assignor to British Steel Corporation, London, England and Lamberton and Company Limited, Coatbridge, Scotland

Filed Jan. 14, 1975, Ser. No. 540,983
Claims priority, application United Kingdom, Jan. 22, 1974, 2840/74
Int. Cl.² B65G *57/04, 57/18*
U.S. Cl. 214—6 FS **5 Claims**



1. Apparatus for piling lengths of ferromagnetic material, which apparatus comprises a conveyor movable from a loading station to an unloading station, means at the loading station for loading a length of ferromagnetic material crosswise on to the conveyor, a rotatable electromagnet at the unloading station having a plurality of circumferentially spaced receiving positions adapted to be sequentially presented to the conveyor on rotation of the electromagnet for supporting a length of the ferromagnetic material, each receiving position being provided with a locating stop for a length of ferromagnetic material and adapted to accept directly from the conveyor and magnetically hold the length of ferromagnetic material, means for rotating the electromagnet and held ferromagnetic material to an orientation in which the ferromagnetic material is immediately above a receiving surface, and means for deactivating the electromagnet in that orientation to release the length of ferromagnetic material and deposit it on to the receiving surface, wherein the conveyor comprises a support element adapted to substantially independent movement (a) from the loading station to the unloading station and (b) upwardly and downwardly relative to the loading and unloading stations, the loading and unloading stations each comprising a support surface capable of being held stationary in a predetermined position, and the limit of the upward and downward movements of the support element on the conveyor at the loading and unloading stations are respectively above and below the support surface in the predetermined positions.

3,985,242

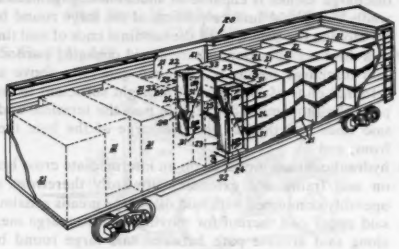
DUNNAGE FILLER

Gary D. Schlaeger, Columbia Heights, Minn., assignor to Burlington Northern Inc., St. Paul, Minn.

Filed July 14, 1975, Ser. No. 595,517
Int. Cl.² B65G *1/14*; B61D *45/00*
U.S. Cl. 214—10.5 R **13 Claims**

1. In a dunnage device, a pair of wedge members in the form of rectangular hexahedrons each elongated along a principal axis and truncated at an acute angle to said axis so that the surface of the truncation is a rectangle having shorter sides orthogonal with said axis, said members being positioned so

that the truncation surfaces are in contact and the principal axes are parallel;



and means limiting relative movement between said members to sliding movement in the direction of the longer sides of said surfaces.

3,985,243

ROTATORY PARKING APPARATUS WITH MEANS FOR SELECTIVELY LIFTING PALLETS FIXED THERETO

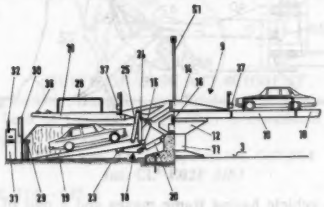
Ernst Ewald Kühner, Fere Champenoise-Str. 8, D-7501 Bruchhausen, Germany

Filed May 19, 1975, Ser. No. 578,665

Claims priority, application Germany, May 22, 1974, 2424939

Int. Cl.[2] E04H 6/06

U.S. Cl. 214—16.1 A 11 Claims



1. Apparatus for parking motor vehicles at a second level above a ground level parking surface, comprising:

a central support column;

a supporting structure mounted on the column so as to be rotatable therearound;

a plurality of parking pallets supported on the supporting structure in side-by-side circumferentially spaced positions, the pallets extending radially relative to the column;

links interconnecting each pallet and the supporting structure whereby said pallet is movable relative to the supporting structure between a raised position and a lowered position corresponding respectively with the said second level and ground level, the pallet being slightly inclined and displaced inwards in the lowered position relative to its disposition in the raised position;

lifting apparatus selectively engageable with the underside of each pallet and operable to effect the said movement thereof between the raised and lowered positions; and

locking means for locking each pallet in the said raised position thereof.

3,985,244

SILO, OR BIN, FOR FLOWABLE SOLID MATERIAL

Hans Gessler, Aalen, and Josef Faul, Wasseralfingen, both of Germany, assignors to Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung, Wasseralfingen, Germany

Filed Nov. 11, 1974, Ser. No. 522,928

Claims priority, application Germany, Nov. 9, 1973, 2356054

Int. Cl.[2] B65G 65/48

U.S. Cl. 214—17 D 11 Claims

3. A bin, or silo, for flowable solid material comprising: a bottom wall, a side wall connected to and upstanding from said bottom wall, a discharge opening formed in said bottom wall, a rotatable discharge member in the bin above said bottom wall for moving material into said discharge opening, and at least one displacement body means supported in said bin above said displacement member and guiding surface means thereon inclined in the vertical direction, said body means being centrally mounted on the bin and the guiding surface means thereon tapering outwardly in the downward direction and having a pointed upper end, support means adjustably supporting said body means on said bin and operable for tilting the body means about at least one axis extending transversely of the bin, said support means including a plurality of pull elements connected to said body means at speced points and extending upwardly therefrom to a position for access externally of said bin.

3,985,245

ARRANGEMENT FOR CHARGING THE COAL BINS OF HOPPER CARS

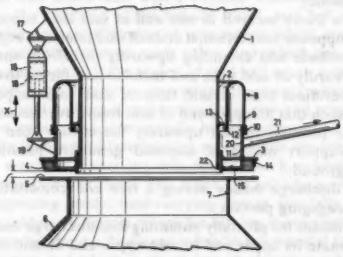
Fritz Schulte, Meerbusch, Germany, assignor to Hartung, Kuhn & Co. Maschinenfabrik GmbH, Dusseldorf, Germany

Filed Jan. 29, 1975, Ser. No. 544,619

Claims priority, application Germany, Jan. 31, 1974, 2404646

Int. Cl.[2] B65G 67/06

U.S. Cl. 214—41 R 10 Claims



1. An arrangement for charging, preferably with preheated coal, coal containers of charging cars for coke oven batteries, comprising in combination a hot coal bunker; an upper con-

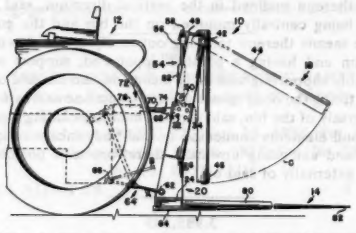
tainer positioned underneath said coal bunker and a lower coal container arranged on a charging car; said upper container having an inlet opening at its top and an outlet opening at its bottom and having an annular peripheral plate associated to the bottom side thereof; said lower coal container having at its top and inlet opening whose diameter substantially corresponds to that of the outlet opening of said upper container, and having a peripheral annular flange around the inlet opening thereof; an annular gasket sealing means being provided on the side of contact between said annular peripheral plate and said annular peripheral flange; a flexible annular sealing member being located proximate to the contact between said annular peripheral plate and said annular peripheral flange; a suction port being located proximate to the outlet opening of said upper container and being connected to an exhaust pipe of a dust separating device; vertically extending telescopable means being arranged to provide a vertical motion of at least one of said upper and lower containers in order to provide sealing contact on said gasket sealing means between said annular peripheral plate and said annular peripheral flange; and moving means operable to cause said telescopable means to extend or contract and thus to produce said vertical motion.

3,985,246

BALE RETRIEVING AND TRANSPORTING APPARATUS

Shaun A. Seymour, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 19, 1974, Ser. No. 498,783
Int. Cl.² B60P *1/00*
U.S. Cl. 214—82 **3 Claims**



1. A large round forage bale handling apparatus, adapted to be mounted on a vehicle and operable to retrieve, transport and discharge large round bales, said apparatus comprising:

a. a load support means disposable in a plane generally parallel to the ground and being adapted to support large round bales thereon, said load support means including a pair of spaced apart tines adapted at their terminal ends to be slipped beneath a large round bale for retrieving the same;

b. a frame secured to one end of said load support means opposite said terminal ends of said tines and adjacent said vehicle and extending upwardly therefrom and bent inwardly of said tines and inclined and facing towards said terminal ends of said tines of said load support means such that an upper end of said frame overlies said tines at a position spaced upwardly therefrom when said load support means is disposed generally parallel to the ground;

c. discharge means having a free end constituting a bale engaging portion;

d. means for pivotally mounting said discharge means proximate its upper end to said upper end of said frame such that said upper end of said discharge means overlies said load support means when the same is disposed generally parallel to the ground, said discharge means being pivotally movable from a lower retrieving position, wherein it extends adjacent said frame and generally downwardly, forwardly of, and along a generally vertically extending surface portion of the large round bale resting on said tines, along a rearwardly and upwardly extending arcuate path, during which said bale engaging portion of said discharge means is capable of slideable engagement upwadly along said surface portion of the large round bale for moving the bale toward the terminal ends of said tines, to a discharge position, wherein said engaging portion of said discharge means is displaced generally above said terminal ends of said tines at a height sufficient to complete the movement of the bale past the terminal end of said tines and thereby the discharge of the bale therefrom; and

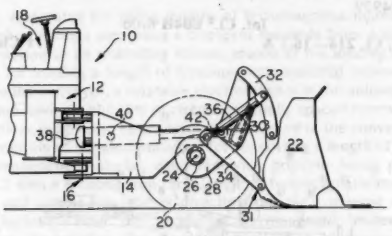
e. hydraulic means mounted on an intermediate cross brace on said frame and extending upwardly therefrom and operably connected with said discharge means proximate said upper end thereof for moving said discharge means along said arcuate path between said large round bale retrieving and discharge positions.

3,985,247

MID-CARRY LOADER

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 31, 1975, Ser. No. 563,865
Int. Cl.² E02F *3/00*
U.S. Cl. 214—140 **13 Claims**



1. In a vehicle having frame means and a pair of wheels rotatable about a common axis relative to said frame means;

arm means pivotally mounted relative to said frame means to be pivotable substantially about the axis of rotation of the wheels;

material carrying implement means;

linkage means interconnecting said arm means and material carrying implement means;

the material carrying implement means being movable, through pivoting of the arm means and actuation of the linkage means, from a position generally on one side of the axis of rotation of the wheels for loading thereof and carrying material therein to a position generally on the other side of the axis on the rotation of the wheels while carrying material therein;

means for supporting the material carrying implement means with material therein, positioned generally on the other side of the axis of rotation of the wheels, wherein the means for supporting the implement means comprises stop means mounted on said arm means, positioned to contact and support the implement means when said implement means is positioned generally on the other side of the axis of rotation of the wheels; and

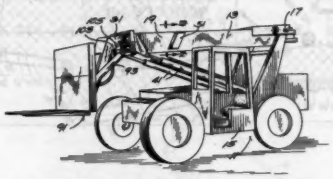
means for selectively pivoting said arm means and actuating said linkage means.

3,985,248

TELESCOPIC BOOM ASSEMBLY

Reinald D. Liegel, Port Washington, and Richard J. Hummel, Cedarburg, both of Wis., assignors to Badger Dynamics, Inc., Port Washington, Wis.

Filed Sept. 25, 1974, Ser. No. 509,138
Int. Cl.² E02F *3/38*
U.S. Cl. 214—141 **9 Claims**



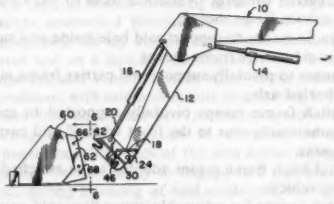
1. A vehicle comprising a ground supported frame, a boom assembly including an elongated generally horizontally extending outer boom pivotally connected to said frame and being of rectangular box construction including a hollow interior, an elongated inner boom telescopically located in said hollow interior of said outer boom and movable relative to said outer boom and being of downwardly open channel construction defining a downwardly open cavity extending for substantially the length of said inner boom to permit access to said cavity, a work element carried at one end of said inner boom, first hydraulic means connected between said outer boom and said frame for tilting said outer boom relative to said frame, and second hydraulic means connected between said inner boom and said outer boom and extending in said cavity for telescopically displacing said inner boom relative to said outer boom, whereby the downwardly open cavity provides access from below to said second hydraulic means while also providing protection from above to said second hydraulic means.

3,985,249

QUICK CHANGE ATTACHMENT

Ludwig E. Aker, Hamilton, and Frederick A. Skanes, Burlington, both of Canada, assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 14, 1975, Ser. No. 567,914
Int. Cl.² E02F *3/81*
U.S. Cl. 214—145 A **9 Claims**



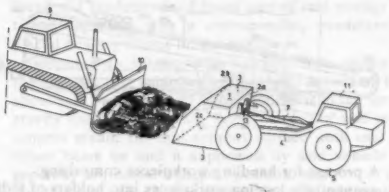
1. A quick change attachment for use on a loader boom assembly comprising:
- an implement carrier frame having a left and a right carrier attached to a transverse stabilizer and spaced apart from each other at either end of said transverse stabilizer;
- pin means for attaching said implement carrier frame to said boom assembly comprising first top and first bottom pair of mounting pins;
- a work implement having upper and lower apertures;
- second top and bottom mounting pins for insertion into said work implement apertures;
- means for attaching said work implement to said implement carrier frame having a pair of carrier saddles incorporated in said left and right carriers that are capable of receiving the second top mounting pins;
- means for aligning said work implement with said implement carrier frame comprising a pair of alignment slots that are capable of receiving said second bottom mounting pins;
- an automatic locking mechanism carried on each of said carriers of said implement carrier frame to secure said work implement to said implement carrier frame;
- a kickoff means mounted on said loader boom assembly of sufficient length that it will initiate locking action through interaction with said automatic locking mechanism when the implement carrier frame is rolled back past the vertical using the loader boom assembly.

3,985,250

VEHICLES FOR TAKING ON, TRANSPORTING, AND DISCHARGING A LOAD

Sakari Matti Mononen, Salkolantie 3 A 15, Nurmijarvi, Finland (01900)

Filed June 19, 1975, Ser. No. 588,349
Claims priority, application Finland, June 20, 1974, 1909/74; May 14, 1975, 1427/75
Int. Cl.² E02F *3/28*
U.S. Cl. 214—146 R **11 Claims**



1. In a self-loading vehicle which is capable of taking on a load, transporting the load, and then discharging the load, elongated substantially horizontal frame means having a pair of opposed end regions, propelling means operatively connected to one of said end regions of said frame means for propelling the latter to cause the vehicle to travel, said propelling means including at least a pair of wheels for engaging the surface on which the vehicle travels, and at least one additional pair of wheels operatively connected with the other of said end regions of said frame means to support the latter during travel of the vehicle, bell crank means pivotally connected with said other end region of said frame means for turning movement with respect thereto about a substantially horizontal bell crank axis which extends transversely with respect to the direction of the vehicle travel, said bell crank means having a pair of elongated arm means which are substantially perpendicular to each other and which are connected to each other at the region of said bell crank axis, one of said arm means being an operating arm means which extends from said bell crank axis toward said one end region of said frame means in a substantially horizontal attitude when the vehicle is in a load-transporting mode while the other of said arm means is a carrying arm means which extends upwardly from said bell crank axis when the vehicle is in said load-transporting mode, load-carrying means pivotally connected to said carrying arm means for turning movement with respect thereto about a discharge axis which is parallel to said bell crank axis and which is situated at an elevation substantially higher than said bell crank axis when the vehicle is in said load-transporting mode, said load-carrying means having a load-carrying position where said load-carrying means extends at least in part from said discharge axis downwardly

toward said operating arm means while the vehicle is in said load-transporting mode, bell-crank displacing means operatively connected between said operating arm means and said frame means for turning said bell crank means about said bell crank axis to a position where said operating arm means extends upwardly from said bell crank axis while said carrying arm means extends from said bell crank axis away from said one end region of said frame means to place the vehicle in a mode for taking on a load and to place said load-carrying means in a load-receiving position, and load-carrier displacing means operatively connected between said load-carrying means and said bell crank means for turning said load-carrying means about said discharge axis while said carrying arm means extends upwardly from said bell crank axis to place the vehicle in a load-discharging mode while turning said load-carrying means with respect to said bell crank means to a load-discharging position.

3,985,251

METHOD FOR HANDLING WORKPIECES

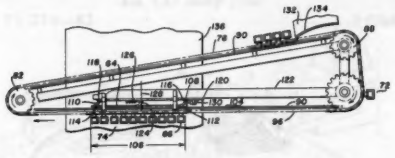
Joseph R. Reilly, Naugatuck, Conn., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 424,866, Dec. 14, 1973, Pat. No. 3,880,301. This application June 19, 1974, Ser. No. 480,604

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² B65G *47/38*

U.S. Cl. 214—152 **4 Claims**



1. A process for handling workpieces comprising:

A. sequentially loading workpieces into holders of individual carrier assemblies;

B. continuously moving said loaded carrier assemblies along a longitudinal path toward a discharge station,

C. simultaneously abruptly shifting a plurality of said holders at said discharge station to release positions while in said longitudinal path to discharge said workpieces from said carrier assemblies without stopping movement thereof;

D. continuing movement of the carrier assemblies away from the discharge station toward the loading station to receive additional workpieces; and

E. resetting said holders before arriving at said loading station.

3,985,252

FEEDING ROD-LIKE ARTICLES

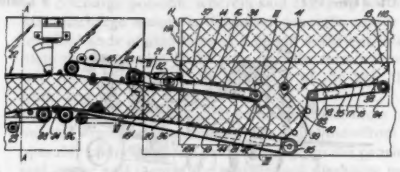
Dennis Hinchcliffe, London; Tom Rowlands, Keston, both of England, and James George Edward Hillman, deceased, late of Bromley, England, by Alice Lilian Hillman, executrix, assignors to Molins Limited, London, England

Continuation of Ser. No. 351,945, April 17, 1973, abandoned. This application June 2, 1975, Ser. No. 583,214

Int. Cl.² B65G *65/04*

U.S. Cl. 214—302 **25 Claims**

1. Apparatus for feeding cigarettes transversely to their lengths out of a succession of rectangular trays having a plurality of side walls, said apparatus comprising means for supporting each tray at a discharge position; two feed conveyors arranged to extend and move towards one another from beneath respective side walls of the tray to provide a uniform withdrawal of cigarettes from across the width of the tray, each of the two feed conveyors comprising bands having protrusions on one side thereof to assist in moving forward the cigarettes adjacent to them transversely to their lengths and the confronting ends of the feed conveyors defining a space between them for the cigarettes to flow smoothly therethrough, the confronting ends of the feed conveyors including



pulleys around which the corresponding bands pass, and means adjacent the pulleys for guiding the cigarettes at a position spaced from said bands in the vicinity of said pulleys; and delivery means extending from below said space and arranged to carry the cigarettes away as a stack transversely to their lengths.

3,985,253

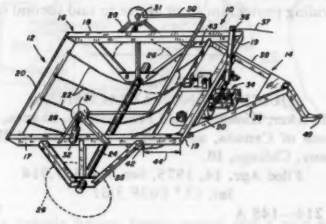
LARGE HAY BALE CARRIER

James W. Kannady; Francis W. Kannady, both of Bixby, and Charles W. Browning, Tulsa, all of Okla., assignors to James W. Kannady, Bixby, Okla.

Filed Mar. 22, 1974, Ser. No. 453,707

Int. Cl.² A01D *90/08*

U.S. Cl. 214—506 **10 Claims**



1. A carrier for large cylindrical bales of hay comprising:

a. a carrier frame means;

b. cradle means to support said bale inside and surrounded by said carrier frame means;

c. means to pivotally support said carrier frame means on a wheeled axle;

d. hitch frame means pivotally supported to said carrier frame contiguous to the front edge of said carrier frame means;

e. said hitch frame means adapted to be attached to a towing vehicle;

f. latch means for releasably connecting said carrier frame means to said hitch frame means;

g. bail means attached to the upper part of said carrier frame means and rotatably supported about an axis parallel to said wheeled axle to encircle said bale; and

h. brake means for said wheels; and operating lever means interconnecting said latch means and said brake means to release the connection between said carrier frame means and said hitch frame means and simultaneously set and hold brake means until said carrier frame means and said hitch frame are reconnected.

3,985,254

SYSTEM AND METHOD FOR LOADING AND UNLOADING A STORAGE APPARATUS FROM A VEHICLE

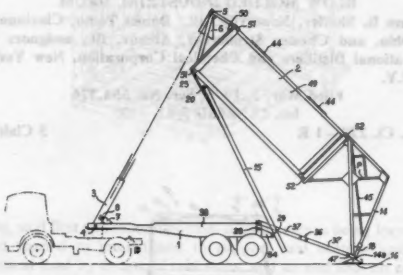
Yves Grandury, La Celle Saint Cloud, France, assignor to Societe Mobiliere Industrielle, Paris, France

Filed July 15, 1974, Ser. No. 488,820

Claims priority, application France, July 25, 1973, 73.27249; Jan. 14, 1974, 74.01163

Int. Cl.[2] B60P *1/64*

U.S. Cl. 214—515 48 Claims



1. A system for transporting, erecting, and selectively retrievably lowering and reloading elongated storage container apparatus, such as a silo/tank assembly having top and bottom end portions, for deposit in a generally upright, but inclined off vertical, operative manner upon a generally horizontal support surface; said system comprising in combination:

a. a wheeled vehicle having an elongated load-carrying chassis with rearwardly disposed bearings means and adaptable to pivotally support the transport said container apparatus in a generally horizontal manner;

b. extendable and retractable telescopic cylinder and piston type handling arm means pivotally mounted on a forward end of said vehicle chassis, and including an extensible free end adaptable for detachable engagement with said container apparatus near its top end portion during selective pivotal erecting and lowering movement about said bearing means, the latter of which include complemental bearing portions on said bottom end portion of said container; and

c. the elongated storage container apparatus comprising:

1. an elongated volumetric storage container having means near the bottom end thereof for emptying the same when in a generally vertical operative condition;

2. first support means including a pair of elongated arms means connected pivotally at one end of said arm means near the top end portion of said container apparatus and on a side of said container which is closely adjacent said vehicle chassis when in the transporting condition, with said arm means terminating in a pair of other free ends; said arm means adaptable to move during container erection to an extended position wherein said free ends of the arm means swing a substantial distance away to engage said support surface, and, during lowering of said container, move to a retracted position relatively close to said container for transporting thereof; and

3. second support means including a framework mounted on and having free ends extended from the bottom end portion of said storage container, when erected, with the bottom end portion elevated a substantial distance above said support surface; and

d. said first and second support means of said container being of different relative lengths such that said container when in the erected operative condition is in a pronounced inclined off vertical condition.

45. In a method for loading a storage container apparatus such as a silo-tank assembly upon a wheeled vehicle having pivotable and selectively extensible and retractable handling arm means disposed adjacent a forward end of the vehicle, the storage container apparatus comprising an elongated container which is adapted to be supported on a generally horizontal support surface in a stabilized generally upright but inclined off-vertical operative position by first support means including two support arm means pivotably connected at their ends to the container near an upper end of the container, and the arms having free ends adaptable for engaging said support surface, and also to be supported by second support means which are mounted at a lower end of the container and which have free ends adaptable for engaging said support surface; the steps comprising:

1. placing the vehicle in a position in which it extends between said support arm means of said first support means, including placing a rearward end of said vehicle in an intermediate position between said free ends of said support arm means and said free ends of said second support means;

2. extending said handling arm means to engage and support an upper part of said storage container apparatus;

3. pivoting said support arm means out of engagement with said support surface in a direction toward said container while supporting the storage container apparatus by said handling arm means;

4. retracting said handling arm means and thereby allowing said storage container apparatus to tilt about said free ends of said second support means under the effect of the force of gravity to an intermediate position of engagement of a predetermined lower part of said storage container apparatus with a corresponding predetermined placed bearing means on the vehicle;

5. continuing to retract said handling arm means and thereby allowing said storage container apparatus to tilt about said bearing means under the effect of the force of gravity and thereby raising said free ends of said second support means off said support surface until said container bears on and is supported by said vehicle in a generally horizontal transport position; and

6. pivoting said support arm means reltaive to said container to a position substantially alongside said container while in the course of said tilting of said storage container apparatus.

3,985,255

BOTTLE CAP

Richard L. Blair, 249 Mattson Ave., Los Gatos, Calif. 95030

Filed Oct. 10, 1975, Ser. No. 621,609

Int. Cl.[2] B65D *41/52*

U.S. Cl. 215—254 3 Claims

1. In combination, a container having: a container neck having an annular end with a substantially circular arcuate upper corner and a downward tapering lower curvature ending in a minimum diameter portion, an annular ring below said minimum diameter portion; and a cap of a flexible plastic material deformable to accommodate minor variations in bottle dimensions and to permit said cap to stretch over said

minimum diameter portion, said cap being preformed and having substantially uniform wall thickness throughout, said cap comprising a flat top disc having a diameter about equal to that of said neck, a depending skirt extending below said minimum diameter portion, and a depending tab connected to said skirt to extend below said skirt, said skirt being weakened by a pair of score lines which are located on the outside surface of said skirt to prevent leakage from the bottle, said score lines being positioned on opposite sides of said tab and extending upwardly toward said flat top disc and diverging outwardly from each other and terminating in the skirt just above said minimum diameter portion, said skirt being tearable along said score lines to open said cap, said cap in position on said neck sealing said neck against either input or output of liquid, said cap when torn along said score lines permitting removal of said cap from said neck and ready replacement thereof on said neck to reseal said bottle.

3,985,256

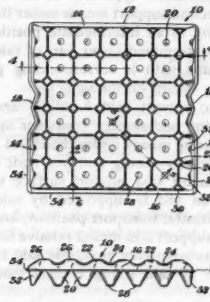
EGG FILLER FLAT

Francis L. Burkett, Breckenridge, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 101,884, Dec. 28, 1970, abandoned. This application Sept. 24, 1973, Ser. No. 400,279

Int. Cl.[2] B65D *81/16, 85/32*

U.S. Cl. 217—26.5 **5 Claims**



1. A highly flexible package useful in bulk handling, storage, and shipping of eggs or like articles comprising a generally curved undulating body member having a peripheral outer edge defining the horizontal outline of said package, said body member including a plurality of downwardly deposed cells with eggs or like articles therein, said cells grouped around a plurality of upwardly tapering support posts having transverse top walls, said cells being defined by side walls which flare upwardly and outwardly from transverse bottom walls, said side walls which are adjacent to one another interconnecting and converging into saddle formation, said posts extending above a plane defining the lowest most point of the upper surface of said saddle formations, said saddle formations curving upwardly to interconnect and converge into said posts adjacent the transverse top walls thereof and having inverted, substantially V-shaped, relatively thin cross sections which are laterally disposed and circumferentially spaced at 90° intervals around said posts, said peripheral outer edge comprising opposing substantially continuous flanges interconnecting with and directed downwardly and outwardly from the top of said posts adjacent the peripheral outer edge and transverse opposing substantially continuous flanges interconnecting with and directed upwardly and outwardly from the bottom of said cells adjacent the peripheral outer edge and having indented handle grip areas, said flanges providing strength for said peripheral outer edge without impeding the horizontal flexibility of said body member, said body member having a high flexibility attributable to the structural design thereof which deforms with a compound curvature and tends to separate adjacent eggs or like articles during rough handling, said high flexibility of said body member being defined by flexibility matrix ratios Q, R, Q′ and R′ wherein Q and R represent a degree of structural design flexibility along the sides of said body member having said indented handle grip areas, and Q′ and R′ represent a degree of structural design flexibility along the opposite sides of said body member, said flexibility matrix ratios have values of from about 0.5, 0.2, 0.6 and 0.3 or greater for Q, R, Q′ and R′, respectively.

3,985,257

BLOW MOLDED INDUSTRIAL DRUM

James B. Shaffer, Naperville, Ill.; Daniel Tomo, Cincinnati, Ohio, and Chester Strohecker, Arthur, Ill., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,376

Int. Cl.[2] B65D *7/42, 1/00*

U.S. Cl. 220—1 R **5 Claims**

1. A drum blow-molded of plastic, said drum including a tubelike sidewall, a top and a bottom at opposite ends of said sidewall, a plurality of rolling hoops projecting outward from said sidewall, a hand-engageable top chime along the periphery of said top and a hand-engageable bottom chime along the periphery of said bottom, first and second bungholes in said top surrounded by respective first and second outwardly extending necks, said bungholes being located at depressed regions of said top that communicate with drainage interruptions in said top chime, and a sump pad formed in said bottom in alignment with one of said bungholes, each of the depressed regions being provided with a plurality of dimple formations symmetrically disposed about each of said first and second necks to maintain ovality of said necks during molding thereof.

3,985,258

KNOCK-DOWN PLASTIC CONTAINER FOR PRODUCE AND THE LIKE

Patrick C. Quigley, 1110 Polynesia Drive, Foster City, Calif. 94404, and James C. Chamberlin, N5512 Drumheller, Spokane, Wash. 99208

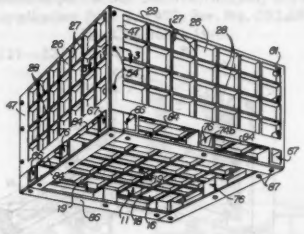
Filed Oct. 1, 1975, Ser. No. 618,443

Int. Cl.[2] B65D *7/00;* **B65J** *1/04;* **B65D** *9/12*

U.S. Cl. 220—4 F **14 Claims**

1. A knock-down container comprising a plurality of identical sides and a bottom having side edges corresponding in number to the number of said sides, said sides and bottom being completely separable from each other and when separated being adapted to be stacked flat on top of each other, each said side having a side panel, a first vertical post along one edge, a second vertical post along the edge opposite said first post, a top-reinforced edge, and a bottom reinforced edge, said first post formed with an outwardly offset re-entrant first shape providing an inward directed rabbet, said second post formed with a longitudinally and inwardly offset second shape complementary to said rabbet, male and female fasten-

ing means in said first and second shapes cooperable with corresponding fastening means of abutting sides to hold said sides assembled edge-to-edge at an angle to each other, first bottom support means on said side edges of said bottom, and second bottom support means on said side edges of said bot-



tom, said first and second bottom support means being located and shaped to interfit and to support said bottom against vertical load by means of said sides, and an end foot on each corner of said container supporting said sides so that said bottom is above the ground, said end foot being an integral downward extension of one of said posts.

3,985,259

ANTI-SIPHONING DEVICE

George A. Zell, 811 Stovall Blvd. NE., Atlanta, Ga. 30342, and Ralph A. Stogner, 2657 Acorn Ave., Atlanta, Ga. 30305

Continuation-in-part of Ser. No. 452,186, March 18, 1974, abandoned. This application Dec. 1, 1975, Ser. No. 636,460

Int. Cl.² B67C 3/00

U.S. Cl. 220—86 AT **2 Claims**

1. An anti-siphoning device for insertion into the fill pipe of a gasoline tank, comprising: a helical spring having an upper cylindrical-shaped portion and a lower cone-shaped portion, said cylindrical-shaped portion being formed of at least six contiguous coils which are arranged in a contiguous relationship around the entire circumference of said coils, said cone-shaped portion commencing immediately following the lowermost contiguous coil of the cylindrical portion and having at least four of the lowermost coils of the cone-shaped portion arranged respectively in a contiguous relationship around the entire circumference of said coils, said contiguous coil portion at the lower end of the cone-shaped portion having its longitudinal axis projecting outwardly at an angle of approximately 45° relative to the vertical axis of the device.

3,985,260

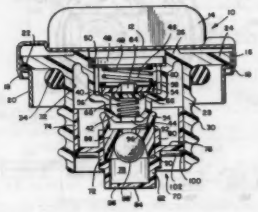
GAS CAP WITH CLAMP-IN ROLL-OVER VALVE

John H. Evans, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Filed Sept. 26, 1975, Ser. No. 617,005

Int. Cl.² B65D 51/16

U.S. Cl. 220—203 **5 Claims**



1. A pressure-vacuum valved cap for a fuel tank having an upwardly extending filler neck formed with a peripherally extending lip concentric with the longitudinal axis of said neck, said cap comprising a cover, a valve body providing a centrally disposed passageway extending axially therethrough concentric with and in communication with said filler neck, means for connecting said valve body to said cover so that said valve body extends axially downwardly into said filler neck, means for providing a seal between said valve body and said lip, said valve body and said passageway having an axially upper end portion and an axially lower end portion, pressure-vacuum valve means disposed in said passageway for normalizing the pressure in the tank, venting the tank to atmosphere when the pressure in the tank exceeds a predetermined super-atmospheric level and when the pressure in the tank drops below a predetermined subatmospheric level, said lower end portion providing a concentric vent opening communicating with said passageway, in which the improvement comprises a rubber-like insert having a concentric opening extending axially therethrough, an upper portion and a lower portion, means for holding said insert against said valve body so that said insert upper portion engages and seals against said valve body about said vent opening, said insert lower portion providing a concentric, axially downwardly facing valve seat, and a ball contained in said cap for movement into closing engagement with said valve seat to close said passageway when the filler neck is tilted downwardly to a predetermined angle, said cap having an axially downwardly projecting sleeve concentric with and spaced radially outwardly from said valve body, said holding means including a carrier member extending upwardly into said sleeve and means for clamping said carrier member in position in said sleeve, said carrier member holding said insert in position relative to said valve body.

3,985,261

TAB HOLD-DOWN

Edmund M. Kulesa, South Holland, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

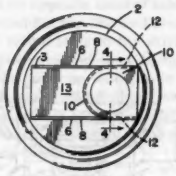
Filed July 14, 1975, Ser. No. 595,641

Int. Cl.² B65D 41/32

U.S. Cl. 220—270 **10 Claims**

1. A pull tab comprising an elongated laminate member made of metal foil and thermoplastic film and having longitudinal edges, a fold along each edge of the member providing strips of plastic superposed with respect to said metal foil, said tab having a body portion and a grasp portion folded over said body portion and having said plastic strips thereon opposing

the respective strips of plastic on the body portion, and fracturable tack weldments between the opposing strips for temporarily holding said grip portion flat against said body portion.



3,985,262

VESSEL PROVIDED WITH A RECESSED LOCKING LID

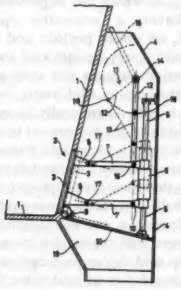
Constant Johan Nauta, Overveen, Netherlands, assignor to Nautamix Patent A.G., Zug, Switzerland

Filed Oct. 7, 1975, Ser. No. 620,429

Claims priority, application Netherlands, Oct. 11, 1974, 7413443

Int. Cl.² B65D *43/20*

U.S. Cl. 220—349 6 Claims



1. A vessel having a closable opening in a wall therein, a locking lid recessed in said wall of said vessel, a mobile supporting member for moving the locking lid so as to open and close said opening, a connecting element comprising at least two rods, one end of each of said rods pivotally connected to the locking lid, the other end of each of said rods pivotally connected to said mobile supporting member, whereby when the lid is in a locked position the pivotal points of the rods substantially coincide with the points of a rectangle.

3,985,263

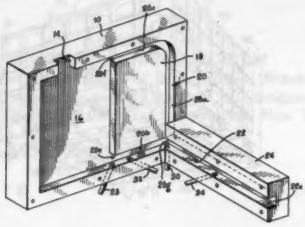
APPARATUS AND METHOD FOR METERING PARTICLES

Roger P. Rohrbach, and Kun Ha Kim, both of Raleigh, N.C., assignors to Research Corporation, New York, N.Y.

Filed Apr. 5, 1972, Ser. No. 241,328

Int. Cl.² B65G *51/02*

U.S. Cl. 221—1 34 Claims



34. A method of metering particles comprising causing a circulating flow of particles through a passage by passing a fluid through said passage, and ceasing the particle flow and retaining a particle in a part of the passage by passing a counterflow of fluid through at least a part of the passage.

3,985,264

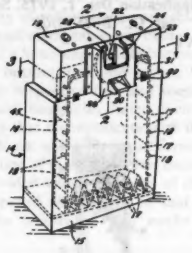
SECURITY SYSTEM FOR CONTROLLED DRUGS

Joseph Denman Shaw, and Adele G. Shaw, both of 508 Church St., Brownsville, Pa. 15417

Filed Aug. 11, 1972, Ser. No. 279,976

Int. Cl.² B65B *57/20*

U.S. Cl. 221—7 11 Claims



1. A dispensing and counting system of controlled drugs comprising a strip of cards each with at least one drug placement indicator means thereon, a reset code on each card associated with the indicator means, means detachably connecting a drug on the card adjacent each indicator means, coding means on the strip identifying each drug, search means directing a selected drug to an ejecting means, drug detecting means operative to actuate the ejecting means and detach said drug from a card into a dispensing position, and counting means associated with the detecting means and the indicator means and adapted to determine the number of drugs dispensed from the strip of cards.

5. A programmed belt to be used in a machine for the controlled dispensation of drugs comprising a longitudinal row of machine feed holes formed in the belt, a number of cards permanently hinged together end-to-end to form the belt, each card having at least one drug detachably secured thereupon and coded in machine readable language identifying that drug, coded machine placement means on a card for each drug adapted to automatically position a searched for drug for machine detachment from its card, a coded machine reset means on each card, and the coded drug machine identifica-

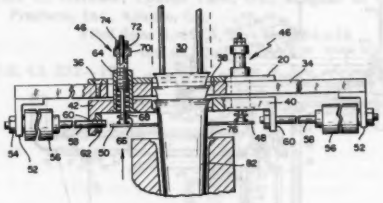
tion means on each card related to the coded machine reset means for machine counting of dispensed drugs.

3,985,265

DESTACKING ASSEMBLY

Donald G. Sauer, Harwinton, Conn., assignor to National Can Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 492,783, July 29, 1974. This application June 2, 1975, Ser. No. 582,684
Int. Cl.² B65G *59/06*
U.S. Cl. 221—221 **5 Claims**



1. An apparatus for selectively removing an article from a stack of such articles which comprises:

a. a supply assembly means for storing a stack of such articles;

b. a support plate means for retaining said stack in said supply means, said support plate means including an upper and lower plate means for engaging the upper portion of an article, said lower plate means being spring loaded with respect to said upper plate means and contacts said lowest article upon withdrawal of said dispensing means to ensure removal of said lowest article from said stack;

c. a dispensing assembly;

d. drive means for moving said dispensing assembly to a position beneath said supply assembly means and for removing said dispensing assembly after the withdrawal of the lowest article from said stack thereof; and

e. motive means for moving said support plate means out of contact with said stack whereby said stack is caused to move to a position at which said stack is temporarily supported by said dispensing assembly and for subsequently returning said support plate means to a position whereat said support plate means contacts the article above said lowest article on said stack to retain thereby the remaining articles of said stack in said supply assembly means.

3,985,266

APPARATUS FOR CONTROLLING THE FEED RATE AND BATCH SIZE OF A MATERIAL FEEDER

Thomas Jack Wright, Jr., Cherry Hill, N.J., assignor to K-Tron Corporation, Glassboro, N.J.

Filed Aug. 13, 1975, Ser. No. 604,506
Int. Cl.² B67D *5/30*
U.S. Cl. 222—22 **13 Claims**

1. Digital control apparatus for controlling the operation of a material feeder, comprising:

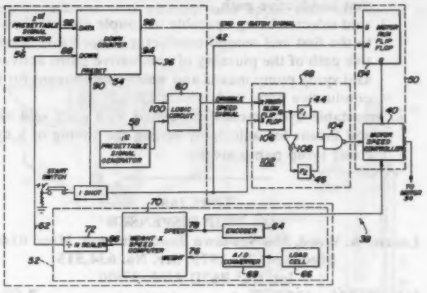
signal generating means for computing the weight of material delivered by said feeder and for generating a dribble speed signal when said weight of material reaches a first preset value and an end of batch signal when said weight of material reaches a second preset value;

means for generating a first pulse train having a first pulse repetition frequency;

means for generating a second pulse train having a second pulse repetition frequency, said second pulse repetition frequency being less than said first pulse repetition frequency;

motor speed controller means for controlling the feed rate of said feeder;

means responsive to said dribble speed signal for applying said first pulse train to said motor speed controller means prior to the generation of said dribble speed signal and for



applying said second pulse train to said motor speed controller means subsequent to the generation of said dribble speed signal;

said motor speed controller means to cause said feeder to deliver material as a feed rate proportional to the frequency of the pulse train applied thereto; and

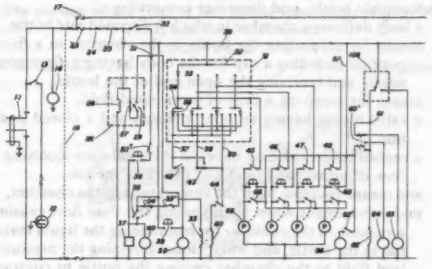
means responsive to the generation of said end of batch signal for causing said feeder to stop delivering material.

3,985,267

LOGIC AND SELECTOR CIRCUITRY FOR FLAVORED-BEVERAGE DISPENSING APPARATUS

Ray E. Selvia, and Allan D. Barden, both of Terre Haute, Ind., assignors to All State Vending Equipment, Inc., Terre Haute, Ind.

Filed Oct. 2, 1974, Ser. No. 511,288
Int. Cl.² B67D *5/56*
U.S. Cl. 222—70 **10 Claims**



1. In a flavored beverage dispensing apparatus having means for dispensing a beverage selected from a plurality of beverages, each of said beverages containing a preset flavor and water type, the improvement which comprises:

a. syrup pump means for supplying syrup associated with the flavor of the selected beverage, said syrup pump means being operable to supply a different syrup of the plurality of syrups when activated;

b. water pump means for supplying the type of water for the selected beverage, said water pump means being operable to supply one of several different water types when activated;

c. a selector;

d. circuit board means engaged with said selector and having a plurality of conductive paths with which said selector is operatively associated, each conductive path of the

plurality of conductive paths corresponding to a different beverage of the plurality of beverages selected from;

1. each said conductive path including a first conductor coupled to said syrup pump means for the beverage for that conductive path and
2. each said conductive path having a second conductor coupled to said water pump means for the beverage for that conductive path,
3. said selector being operable to couple electrical power to the first and second conductor at each said conductive path of the plurality of conductive paths activating said syrup pump means and water pump means for that conductive path; and

e. presetable cycle means associated with each said syrup pump means for adjustably setting the timing of a cycle for said syrup pump means.

3,985,268

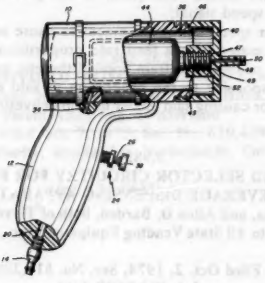
NON-DRIP DISPENSER

Laurier A. Wood, 550 Newtown Road, Littleton, Mass. 01460

Filed Nov. 24, 1975, Ser. No. 634,515

Int. Cl.² B67D *1/16, 37/00*

U.S. Cl. 222—108 **7 Claims**



1. A dispenser for a liquid material that is contained in a deformable bottle, said dispenser comprising;

a body defining a chamber in which is disposed said bottle,

means for supporting the bottle in the chamber in a fixed position including a cap for the body having a dispensing nozzle and receiving the open end of the bottle,

means for receiving a flow of pressurized fluid,

a valve means having an open position and a closed position,

a venturi tube extending between the means for receiving a flow of pressurized fluid and the valve means,

and means coupling from the venturi tube to the chamber,

said valve means when open venting the fluid flow causing a vacuum in the chamber for maintaining the liquid material in the bottle, and when closed directing the pressurized fluid to the chamber causing the bottle to contract and thereby force an amount of liquid material from the dispensing nozzle.

3,985,269

AUTOMATIC LIQUID DISPENSING APPARATUS

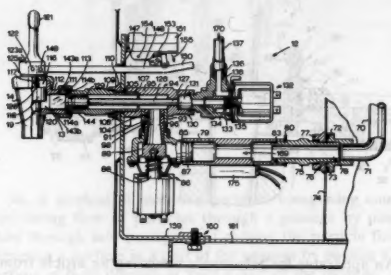
William Milton Bardeau, 33 Harbour Square, Suite 3218, Toronto, Canada (M5J2G2), and Frank Welty, 4962 Lockwood Blvd., Youngstown, Ohio 44511

Continuation-in-part of Ser. No. 388,948, Aug. 16, 1973, Pat. No. 3,843,020. This application Aug. 5, 1974, Ser. No. 494,827

Int. Cl.² B67D *5/60*

U.S. Cl. 222—145 **16 Claims**

1. In apparatus for dispensing a liquid derived from two liquid components to be delivered separately from their sources to a confluence downstream before discharge, the combination of a first larger conduit section terminating downstream in a discharge orifice and adapted for connection upstream with a first liquid source, and a second smaller conduit section supported within said first larger conduit section and in spaced relation thereto to define a surrounding passageeway therewith in the region between said discharge orifice and upstream connection of said first larger conduit section, said second smaller conduit section being adapted for connection upstream to a second liquid source and terminating downstream in an orifice defining a flow path intersecting with the flow path defined by said surrounding passageway, said second smaller conduit section including a downstream portion and an upstream portion with said downstream portion having said orifice therein and being axially slidably separable from said upstream portion, said downstream portion comprising a cap formation adapted to snugly slidably receive the downstream end of said upstream portion in conduit defining relation, and means for releasably locating and securing said axially slidably separable cap formation in fixed relation to said upstream portion and to said surrounding first larger conduit section in conduit defining relation comprising a fin formation extending radially outwardly of said cap formation and socket means presented by said surrounding first larger conduit section for snugly receiving the portion of said fin formation remote from said cap formation to anchor same therewithin against displacement.



3,985,270

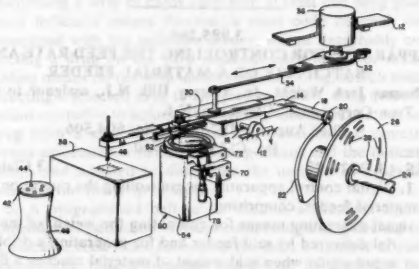
EPOXY APPLICATION APPARATUS

James T. Larkin, Laguna Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 7, 1975, Ser. No. 620,432

Int. Cl.² B67D *15/00*

U.S. Cl. 222—168 **6 Claims**



1. An adhesive source comprising:

an adhesive pot having an axis, said adhesive pot being mounted for rotation about said axis, means for rotating said pot about said axis;

said adhesive pot having a concentric groove therein defined by walls, said walls being spaced away from said axis so that said walls are surfaces of revolution about said axis, said groove being for containing adhesive between its walls;

squeegee blade means mounted with respect to said walls for leveling the surface of adhesive in said groove as said adhesive pot is rotated on its axis so that a transfer tool can pick up adhesive from a freshly squeegeed and levelled adhesive surface behind said squeegee blade.

3,985,271

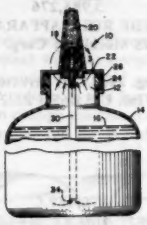
FOAM GENERATING AND DISPENSING DEVICE

Jack C. Gardner, College Park, Ga., assignor to Glasrock Products, Inc., Atlanta, Ga.

Filed June 6, 1975, Ser. No. 584,610

Int. Cl.² B65D *37/00*

U.S. Cl. 222—190 **12 Claims**



1. A foam generating and dispensing device for a collapsible bottle adapted to contain foamable liquid and air, said device comprising:

a cap element tubular formation defining a discharge passage to extend between the interior and exterior of said bottle, said passage having an interior end to be positioned near one vertical extremity of said bottle;

a rigid, polymeric porous member mounted in the interior end of said passage, at least a portion of said porous member being exposed to the bottle interior at said one vertical extremity thereof, said porous member having a longitudinally extending opening defined exclusively by internal surfaces of said porous member;

an imperforate tube terminating at one end extending partially within said longitudinally extending opening of said porous member to be supported by said porous member and opening at its other end near the vertical extremity opposite from said one vertical extremity; and

one-way valve means to allow the passage of air from the exterior to the interior of the bottle whereby forced collapse of the collapsible bottle will force both liquid and air through said porous element to generate foam to be discharged from said discharge conduit and restoration of the bottle to its initial conformation will occur due to return of air through said one-way valve means, said one-way valve means being formed by a valve chamber and seat established by the internal surface portions of said porous member defining said longitudinally extending opening, and a ball check movably contained in said valve chamber.

3,985,272

GRAVITY CONTROLLED BEVERAGE DISPENSER

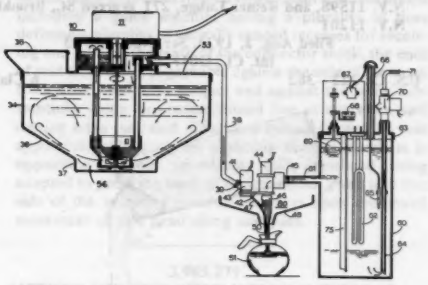
Joseph John Rodth, Barkhamsted, Conn., assignor to The Coca-Cola Co., Atlanta, Ga.

Filed Jan. 15, 1975, Ser. No. 541,167

Int. Cl.² B67D *5/06*

U.S. Cl. 222—205 **9 Claims**

1. A beverage dispenser having a container for holding an additive fluid to be dispensed wherein pumping means comprising an upper housing and a lower housing are provided within the container for agitating a dispensable additive fluid and lifting the dispensable fluid to an elevated position within the container, and wherein the pumping means are provided with an upper reservoir cavity for receiving the dispensable additive fluid at said elevated position, said upper housing and lower housing being held in spaced relationship by at least one support column, and wherein said upper reservoir cavity is



formed integrally with (provided in) the top surface of the upper housing, said upper housing comprising a plate having an outer peripheral wall that tapers down to said upper reservoir cavity, and further wherein the upper reservoir cavity is provided with an outlet aperture for controlled gravity feed of the dispensable additive fluid in an accurately metered proportional flow from the upper reservoir cavity to a dispensing nozzle located below.

3,985,273

CAULKING GUN ADAPTER FOR AN ELECTRIC HAND DRILL

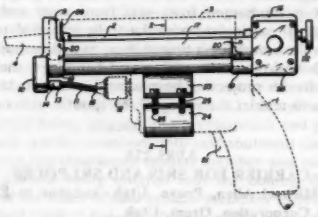
George B. Davis, Jr., 7512 Marbury Road, Bethesda, Md. 20014

Continuation-in-part of Ser. No. 446,961, Feb. 28, 1974, Pat. No. 3,913,799. This application June 12, 1975, Ser. No. 586,513

The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.

Int. Cl.² B67D *5/46*

U.S. Cl. 222—326 **12 Claims**



1. A caulking gun including in combination a receptacle for receiving therein a caulking cartridge having a caulk dispensing nozzle thereon, a piston having thereon a rack gear, said piston being movable when driven through said cartridge to force caulking therein from said nozzle, driving means for said piston including a pinion gear threadedly engaging said rack gear upon said piston and operative when rotated to drive said piston through said cartridge, a speed reducing drive train disposed for connecting said pinion gear with a power source, said drive train being operative when driven by said power source to affect rotation of said pinion gear, and load responsive clutch means in said drive train between said power source and said piston and operative upon a predetermined

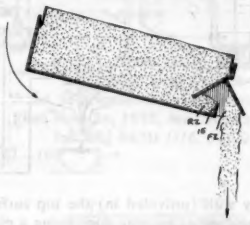
movement arresting force applied to said piston during operation of said power source to drivably disengage said piston from said power source.

3,985,274

DISPENSER-COVER FOR CONTAINERS FILLED WITH GRANULAR OR POWDERED MATERIAL

Herbert Lubalin, 1024 W. Broadway, Woodmere, Long Island, N.Y. 11598, and Reiner Lubge, 271 Warren St., Brooklyn, N.Y. 11201

Filed Aug. 2, 1973, Ser. No. 384,793
Int. Cl.² G01F *11/26*
U.S. Cl. 222—362 **6 Claims**



1. A dispenser-cover unit for a container filled with particulate material, such as ground or powdered coffee, the unit being adapted to discharge a metered amount of said material each time it is tipped over; said unit comprising:

A. a cap having a top wall and a cylindrical side wall dimensioned to engage the rim of the container, said side wall having a generally rectangular opening therein whose upper edge is defined by said top wall, and

B. a trough-shaped spout received in said opening and having sector-shaped end walls, the apex of said spout extending along the lower edge of said opening and being pivoted on said side wall, and

C. a divider extending across said spout between said end walls to partition the upper section thereof into a front zone and a rear zone and to define therebelow a free lower section, said spout being swingable from an open position in which the upper edge of said divider abuts said top wall of the cap and said front zone is exposed while said rear zone lies within said container whereby a charge of particulate matter held in the lower section of the spout is discharged from said front zone and a fresh charge of particulate material spills into said rear zone when the container is tipped over, to a closed position in which both zones lie within said container, the ends of said divider projecting beyond said end walls to provide limits to restrict the swing of the spout.

3,985,275

CARRIER FOR SKIS AND SKI POLES

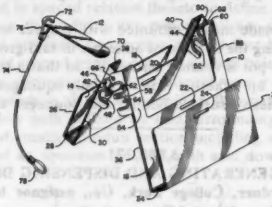
Richard Michael Allen, Provo, Utah, assignor to Electronic Chassis Corporation, Orem, Utah

Filed Apr. 21, 1975, Ser. No. 570,338
Int. Cl.² B65D *71/00*
U.S. Cl. 224—45 S **5 Claims**

1. A hand portable carrier for a pair of skis and a pair of ski poles, comprising:

channel means for receiving two skis in parallel relation the channel means comprising two separate ski receiving channels, each channel opening upwardly to receive a ski therein and each channel is pivotally joined to each other;

means connected to the end of each of said channel means for supporting the ski poles in parallel relation above the skis the support means being configurated with an opening through which the ski poles pass to accommodate at least one of the ski poles as a carrying handle for the carrier, said ski poles being selectively releasable from the support means; and



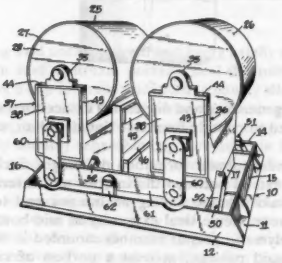
means selectively locking both the skis in the channel means and the ski poles in the supporting means.

3,985,276

GUIDE ROLL APPARATUS

Carl H. Minton, ADS Machinery Corp. P.O. Box 1027, Warren, Ohio 44482

Filed Aug. 21, 1975, Ser. No. 606,569
Int. Cl.² B65H *25/26*
U.S. Cl. 226—21 **16 Claims**



4. Roll guide apparatus insertable within a strip processing line for correcting deviation of a running strip from a predetermined longitudinal line of said strip processing line, comprising:

a base,

a pair of rotatable rolls carried by said base, the axes of rotation of said rolls lying within respective ones of two spaced planes which are in parallel relation,

said strip being adapted to run flatwise over a peripheral portion of one roll, between said rolls in a plane transverse to said two spaced planes and over a peripheral portion of the other roll in its path of travel in said processing line,

said rolls being normally within position wherein the axis of rotation of both rolls lie within a single plane which is transverse to said two spaced planes, and

means for tilting the axis of each roll within a respective one of said two spaced planes and to displace the axis of rotation of each roll from said single plane in a manner to move opposite ends of the roll in opposite directions.

3,985,277

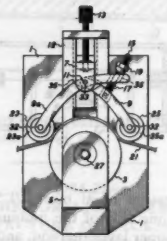
WEB HANDLING DEVICE

Allen T. Wright, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1975, Ser. No. 562,369
Int. Cl.² B65H *17/22*
U.S. Cl. 226—177 **6 Claims**

1. Web forwarding apparatus comprising a pressure roll mounted for rotation having a peripheral surface suitable for

drivingly engaging the web to be forwarded, two pressure arms pivotally mounted about a common pivot means with a nonpivoted end of each arm extending tangentially toward the roller to guide the web to be forwarded into contact with at least a portion of the periphery of the pressure roll, bias means coupled to the pressure arms outside the region between the arms,



the pivot means and the pressure roll to urge the arms toward one another into contact with the periphery of the pressure roll and yoke means supporting said common pivot means adapted to be moved radially to and from the axis of rotation of the pressure roll to change the amount of contact between the web being forwarded and the periphery of the pressure roll.

3,985,278

AUTOMATIC FRAME MACHINE

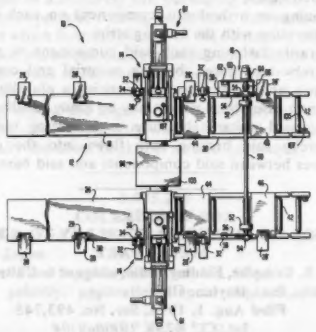
John Calvin Jureit, Coral Gables; Adolfo Castillo; Roy Leutwyler, both of Miami; Larry Brodsky, Sunrise, and Ben Kushner, Miami, all of Fla., assignors to Automated Building Components, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 488,006, Dec. 12, 1974, Pat. No. 3,913,816, which is a continuation of Ser. No. 317,095, Dec. 20, 1972, abandoned. This application Apr. 7, 1975, Ser. No. 565,756

The portion of the term of this patent subsequent to Oct. 21, 1992, has been disclaimed.

Int. Cl.² B27F 7/02

U.S. Cl. 227—86 **58 Claims**



1. Apparatus for forming discrete connector plates of the type having a plurality of integrally struck teeth from elongated sheet metal stock and embedding the teeth of the connector plates into a pair of adjoining wooden members comprising:

support structure, a presshead carried by said support structure for movement along a predetermined path, means for moving said presshead along said predetermined path, a cutting edge carried by said presshead for movement therewith, a die set carried by said support structure for striking teeth in the metal stock, means carried by said support structure for feeding the connector stock through said die set and into the path of movement of said head, means for actuating said die set to strike teeth from the metal stock as the stock is fed through said die set, reaction means carried by said support structure and cooperable with said cutting edge for cutting the stock as said presshead moves along said path thereby to form a connector plate of predetermined length, said reaction means including a guide member having a plurality of tines defining a plurality of laterally spaced recesses for receiving and guiding the teeth of the connector stock, the ends of said tines being engageable against the side of the stock from which the teeth project and against the stock substantially along its predetermined line of cut when said cutting edge cuts said plate, and means carried by said apparatus for locating the adjoining wooden members in opposition to said presshead, said presshead being adapted to press the teeth of the connector plate into one side of the adjoining wooden members upon continued movement of said head along said path.

3,985,279

METHOD FOR EXPLOSIVE WELDING TUBULAR MEMBERS USING A MANDREL

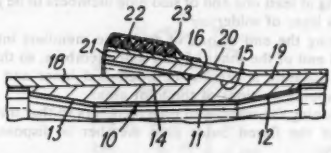
Wayne Richard Wilson, Bath, and William James Kirkpatrick, Kingston, both of Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed June 10, 1974, Ser. No. 478,158

Claims priority, application Canada, June 13, 1973, 173964

Int. Cl.² B23K 21/00

U.S. Cl. 228—109 **6 Claims**



1. A method of forming a joint between the ends of two tubular metal members comprising forming a substantially conical flared end portion in one of said tubular metal members, bringing said tubular metal members into alignment with one another by means of a permanent, non-collapsible, tubular mandrel having a cylindrical outer surface portion and a conical outer surface portion separated from said cylindrical outer surface portion by a shoulder constituting a surrounding annular abutment of approximately the same dimension as the wall thickness of said tubular members, said cylindrical surface portion being entered into a cylindrical end portion of one of said tubular members until said abutment contacts the end of said last-mentioned tubular member and said conical surface portion being entered into the conical flared end portion of the other of said tubular members to bring an end part of said conical flared end portion into overlapping relation with said cylindrical end portion, thereby defining an annular wedge-shaped space between said end portions of the tubular members, placing an explosive charge around the outer surface of said cylindrical flared end portion in register with said annular wedge-shaped space and firing said charge to weld said end portions to one another, said conical flared end portion of the aforesaid tubular metal member that has such portion, and said conical outer surface portion of the mandrel being mutually dimensioned in such way that when said conical portion of the mandrel is brought into the said conical flared portion for said overlapping relation of the end part of the conical flared portion with the cylindrical portion of the other tubular member, said conical surface portion of the mandrel then underlies and supports another part of said

conical flared portion which is axially adjacent to said overlapping end part.

3,985,280

METHOD OF JOINTING COPPER PIPE TO ALUMINUM PIPE BY SOLDERING

Kenkichi Yamaji; Dietrich Oelhschlagel, and Hajime Abe, all of Hitachi, Japan, assignors to Hitachi Cable, Ltd., Japan

Filed June 19, 1975, Ser. No. 588,361
Int. Cl.² B23K 1/06
U.S. Cl. 228—110 8 Claims

1. A method of making a joint between a copper pipe member and an aluminum pipe member comprising the steps of

a. flaring one end of one of said pipe members in such a way that one end of the other pipe member can be inserted into the flared portion, leaving a clearance therebetween to provide inner and outer overlapping portions defining a joint area;

b. coating at least one end of said pipe members to be joined with a layer of solder;

c. inserting the end of one of said pipe members into the flared end of the other of said pipe members, so that the solder coating is present between said inner and outer overlapping portions of the joint area;

d. positioning the assembled pipe members so that the open end of the flared outer pipe member is disposed upwardly;

e. heating the assembled pipe members so that at least the portion of the ends of the pipe members precoated with solder reach a temperature of at least the melting point of the solder;

f. applying ultrasonic vibrations directly to a portion of at least one of said pipe members so that the ultrasonic vibrations are transmitted to the joint area through the pipe member, while the solder is molten in the clearance of the joint area;

g. cooling said pipe members after terminating the ultrasonic vibrations to solidify the solder in the joint area.

3,985,281

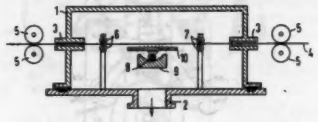
METHOD OF PRODUCING AN ELECTRICAL CONDUCTOR

Heinrich Diepers, Erlangen-Bruck; Hans Pfister, Erlangen, and Karl-Heinz Jablonski, Ebermannstadt, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 9, 1972, Ser. No. 261,246
Claims priority, application Germany, June 15, 1971, 2129624
Int. Cl.² B05D 5/12; C23C 11/00
U.S. Cl. 228—148 10 Claims

1. Method of producing a conductor for a superconducting cable or the like, the conductor being made up of at least niobium and copper, the method comprising heating a niobium carrier to a temperature between 150° and 800°C in a vacuum having a residual gas pressure of at most 10^{-4} Torr and then letting the carrier cool down, evaporating copper onto the cooled down niobium carrier, and heating the copper-coated niobium carrier to form a tightly adhering copper layer thereon.

7. Method of producing a conductor for a superconducting cable or the like, the conductor being made up of at least niobium and electrically normal-conducting copper, the method comprising heating a band-shaped niobium carrier to a temperature between 150° and 800° C in a vacuum having



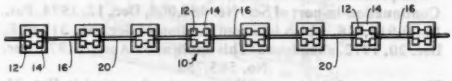
a residual gas pressure of at most 10^{-4} Torr, evaporating copper unto only one side of the niobium carrier to form a tightly adhering copper layer thereon, and joining at least one copper-coated, band-shaped niobium carrier to a tube also made of an electrically normal-conducting metal, the carriers being joined to the tube at the side of the carriers coated with copper.

3,985,282

BRAZING PROCESS FOR ORTHODONTIC ASSEMBLIES

Frank R. Miller, 1126 Fairview Ave., Apt. 105, Arcadia, Calif. 91006, and Craig A. Andreiko, 517 N. Holliston, Pasadena, Calif. 91106

Filed Apr. 17, 1975, Ser. No. 568,962
Int. Cl.² B23K 31/00
U.S. Cl. 228—175 14 Claims



1. A method of making orthodontic assemblies comprising:

aligning a plurality of bases;

positioning at least one strip of brazing material across the aligned bases;

positioning an orthodontic component on each said base cooperating with the brazing strip;

temporarily fastening each said component to each base whereby said bases, brazing material and components form a unitary structure comprising a plurality of orthodontic assemblies which may be easily handled; and

heating said unitary structure to a brazing temperature whereby said brazing strip flows into the interstitial spaces between said components and said bases.

3,985,283

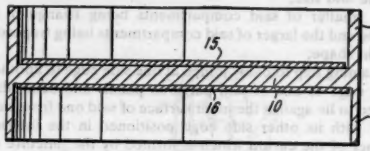
METHOD OF JOINING BRAZE ALLOY TO A PARENT METAL PART

Edward B. Gempler, Findlay, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Aug. 1, 1974, Ser. No. 493,745
Int. Cl.² B23K 19/00, 1/04
U.S. Cl. 228—193 17 Claims

1. A method of joining braze alloy to at least selected surfaces of a rigid irregularly shaped part later to be united with other parts in a brazing process, said part being comprised of a brazeable parent metal, including the steps of superimposing braze alloy in solid form on said selected surfaces of said part as a cladding using applied external pressure to obtain an intimately contacting relation of said cladding with said part, and in an interval during which said applied pressure is maintained subjecting the assembly comprising said part and said cladding to an elevated temperature which is below the melt-

ing point of the parent material of said part and which approaches but is less than the melting point of the braze alloy



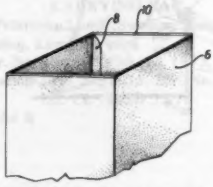
to join the braze alloy to said part while retaining its individual character as a cladding.

3,985,284

MATERIAL IN THE FORM OF A WEB OR OF SHEETS FOR THE MANUFACTURE OF PACKING CONTAINERS OR PARTS THEREOF

Jan F. Palsson, Lund, Sweden, assignor to AB Ziristor, Lund, Sweden

Filed July 30, 1974, Ser. No. 493,134
Claims priority, application Sweden, Aug. 2, 1973, 7310635
Int. Cl.² B65D *5/42, 1/00, 3/00, 5/00*
U.S. Cl. 229—3.5 R **4 Claims**



1. A packaging material for manufacturing packing containers, said material having a planar form and said containers being closable by abuttingly sealing a lid member to the upper edges of the walls of said containers, said material comprising a base layer of a relatively stiff packaging material, an impermeable thermoplastic coating on at least that surface of said base layer which forms the inside of the container, at least that edge of said planar packaging material which forms the upper edge of the walls of the container being provided with a relatively narrow portion of a heat-activatable bonding agent projecting beyond the edges of the base layer, said projecting portion extending coplanarly with said base layer and having substantially the same thickness as said base layer.

3,985,285

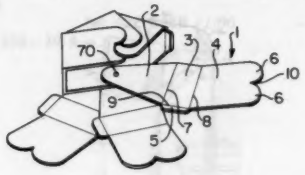
COLLAPSIBLE BOX

Yoshiko Kitagawa, 17-25, Wakabayashi 2-chome, Setagaya, Tokyo, Japan

Filed Sept. 8, 1975, Ser. No. 611,411
Claims priority, application Japan, Sept. 9, 1974, 49-108365
Int. Cl.² B65D *5/32*
U.S. Cl. 229—8 **15 Claims**

1. A collapsible box comprising:

a plurality of unit members each divided, in sequence, into a generally triangular base portion, at least one side wall portion extending from the base portion with a fold line therebetween, and a lid portion provided at the end thereof with a fold line between the lid portion and a side portion, said lid portion having two adjacent generally semicircular inter-engaging portions forming a notch therebetween at the end thereof, said fold line between said base portion and said side wall portion immediately adjacent thereto being always parallel to said fold line between said lid portion and said side wall portion immediately adjacent to said lid portion; and



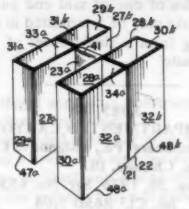
means for pivotally connecting said unit members together at a point close to the apex of each base portion.

3,985,286

SIX-CELL BOX DIVIDER

Billy R. Hicks, Winona, Tex., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Apr. 1, 1976, Ser. No. 672,681
Int. Cl.² B65D *5/48*
U.S. Cl. 229—15 **27 Claims**



1. A blank for forming a divider adapted to partition a rectangular space into six cells, the blank having formed therein a plurality of spaced score lines parallel with one another and with opposite ends of the blank, the blank comprising a central panel and a pair of panel sections, each panel section including a second panel, a third panel, a fourth panel, and an end panel extending in that order from the central panel to a respective one of said ends, adjacent ones of the panels of the blank being hingedly connected to one another along one of the parallel score lines, the widths of the panels thereby being determined by the locations of the score lines, the widths of the second panels being substantially equal to one another and to the widths of the fourth panels, in each of the panel sections the width of the end panel being greater than the width of the third panel, the sum of the widths of the end panels being not greater than the sum of the widths of the central panel and third panels, whereby when the fourth and end panels of each panel section are folded flatly onto the second and third panels thereof, an end portion of each panel will overlie a respective portion of the central panel, the blank being cut and further scored along a median portion thereof forming right angles with the parallel score lines to provide hinge means and cut line means dividing the panels into half-panels, the cut line means traversing at least the second, third and fourth panels.

3,985,287

CARTON

Dwight L. Stetler, 10410 Dorothy Ave., South Gate, Calif. 90280

Filed Aug. 21, 1975, Ser. No. 606,485
Int. Cl.² B65D 5/02
U.S. Cl. 229—37 R 5 Claims

1. A one-piece blank foldable to form a carton of rectangular cross section having closed ends, said blank comprising:

a sheet material body portion;

said body portion including crease lines defining side-by-side, consecutive first, second, third and fourth side panels, further defining end panels at the ends of said first and third side panels, and further defining sealing flaps at the sides of said end panels; and

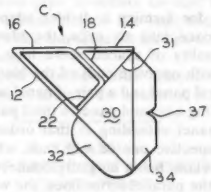
each of said second and fourth side panels having a width equal to the sum of the width of one of said first and third side panels, and four times the width of one of said sealing flaps at the sides of one of said end panels, whereby a plurality of blanks may be internested in end-to-end relation for cutting from a single sheet of material with a minimum of waste.

3,985,288

COMPARTMENTED CARTON

Richard L. Bell, Glenmoore, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Jan. 30, 1976, Ser. No. 653,765
Int. Cl.² B65D 5/08
U.S. Cl. 229—38 2 Claims



1. In a collapsible, triangular, tubular, compartmented carton formed of foldable paperboard, the combination of:

a. a pair of first and second front side walls foldably joined to each other along corresponding side edges;

b. a rear wall including a pair of coplanar rear wall panels, foldably joined at their outboard side edges to other corresponding side edges of said side walls, and having their inboard side edges in juxtaposition with each other;

c. a pair of co-extensive partition panels having corresponding side edges foldably joined to respective inboard side edges of said rear wall paneis and being secured to each other in face-to-face relationship to form a common partition;

d. said partition extending into said carton to a medial portion of one of said front side walls to divide the interior of said carton into two compartments of unequal shape and size;

e. the smaller of said compartments being triangular in shape and the larger of said compartments being trapezoidal in shape;

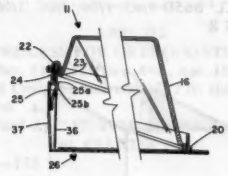
f. a retaining flap foldably joined at one side edge to another side edge of one of said partition panels and being disposed to lie against the inner surface of said one front side wall with its other side edge positioned in the interior corner of the carton which is formed by the juncture of said front side walls.

3,985,289

TWO-PIECE CONTAINER

Kenneth E. Prince, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 10, 1975, Ser. No. 566,880
Int. Cl.² B65D 5/66, 45/00
U.S. Cl. 229—44 R 1 Claim



1. A container comprising first and second sections, said first section having a rear wall formed from a pair of inner and outer integral flexible panels with the inner panel having a cutout and the outer panel having a cut parallel to its top edge juxtaposed to said cutout, said second container being removably connected to said first section by a flat tongue extending from a rear wall of said second section and positioned between said first section rear walls, said tongue having a transversely formed, wedge-shaped configuration snugly fitting in said cutout with the tapered portion of said wedge-shaped configuration pointed toward the end of said tongue, said tongue being integrally connected to said second section rear wall by a hinge element having a hollow portion closely straddling an upper edge of said first section rear wall and a stabilizing flange in adjacent contact with the interior of said first section rear wall when the container is closed.

3,985,290

FOLDED BAG HANDLE

Thomas John Smrt, 31W 300 W. Bartlett Road, Bartlett, Ill. 60103

Filed Aug. 25, 1975, Ser. No. 607,438
Int. Cl.² B65D 33/06
U.S. Cl. 229—54 R 2 Claims

1. A handle-equipped bag comprising a carrying handle formed from a sheet of folded material, the sheet being folded approximately in half about a first fold line to provide a pair of overlapping sheet portions having a folded edge and a pair of generally overlapping edges opposite the folded edge, the folded sheet having an upper portion and a lower portion, the upper portion being folded about a second fold line extending generally perpendicularly to the first fold line to provide a pocket between the upper portion and the lower portion, means securing the folded upper portion to the lower portion, and a bag having an upper end inserted into the lower portion

of the handle between the overlapping sheet portions and means securing the upper end of the bag to at least one of the

overlapping sheet portions whereby the bag can be held and carried by the carrying handle.

3,985,291

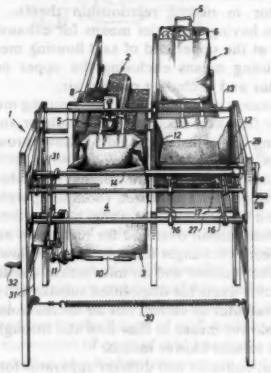
CARRYING BAG

Boye Benzon-Petersen, Lund, Sweden, assignor to AB Akerlund & Rausing, Lund, Sweden

Division of Ser. No. 405,008, Oct. 10, 1973, abandoned. This application June 27, 1975, Ser. No. 590,911

Int. Cl.² B65D *33/10*

U.S. Cl. 229—54 R **3 Claims**



1. A plurality of carrying bags arranged in parallel stacked relation for subsequent withdrawal one by one from the stack, each bag having two opposed parallel side walls folded flat against each other and a bottom panel folded flat against the outside of one of the parallel side walls of the bag and having opposed handle members disposed centrally of the top of the opposed side walls, one handle member extending outwardly from the top of the bag and the other handle member being folded downwardly from the top of the bag, the downwardly folded handle member and the folded bottom panel of each bag of the plurality of bags being disposed in the same relative position with respect to each other.

3,985,292

SELF-CLEANING CENTRIFUGE DRUM WITH A PISTON VALVE DEFINING ONE SIDE OF THE SLUDGE CHAMBER

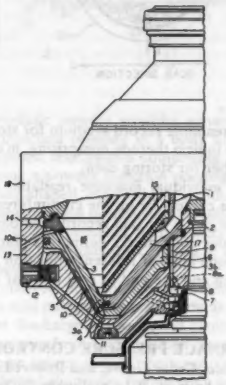
Reinhard Schmidt, Oelde, Germany, assignor to Westfalia Separator AG, Oelde, Germany

Filed Nov. 5, 1973, Ser. No. 413,147

Claims priority, application Germany, Dec. 27, 1972, 2263664

Int. Cl.² B04B *11/00*

U.S. Cl. 233—20 A **4 Claims**



1. In a centrifugal separator constructed for intermittent discharge of sludge, comprising:

a. a rotatably mounted separator drum having an upper end member and a lower end member enclosing the separating chamber, at least one sludge discharge passageway disposed at the radially outward periphery of the drum,

b. a piston valve disposed within the drum defining one end of the separating chamber, movable vertically to open and close the sludge discharge passageway for desludging,

c. a closing chamber disposed outwardly of the piston valve extending from adjacent the axis of the drum to adjacent the radially outward periphery thereof, defined in part by the axially outward side of the piston valve, for receiving and discharging fluid for, respectively, forcing the piston valve to the closed position and relieving force initiating the moving of the piston valve to its open position,

d. means for supplying fluid to the closing chamber and means for discharging fluid therefrom,

e. a cap mounted in the drum at a fixed position along the axis of the drum, covering only a portion of the piston valve, on the axially inwardly disposed side thereof, the piston valve being in sliding, sealing relation with the cap, said cap defining with the covered portion of the piston valve, an opening chamber for receiving and holding fluid for assisting the positioning of the piston valve to open said sludge discharge passageway,

f. means for supplying fluid to the opening chamber for said holding of fluid thereby,

the improvement which comprises:

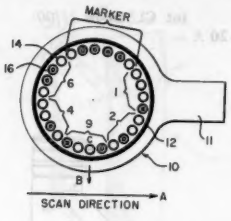
g. means for discharging fluid from the opening chamber for the emptying thereof for assisting the positioning of the piston valve to close said sludge discharge passageway in response to force imposed on the piston valve by fluid introduced into the closing chamber.

3,985,293

MACHINE READABLE MERCHANDISE MARKING TAG

Lyle G. Riffee, and William R. Horst, both of Dayton, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 4, 1974, Ser. No. 520,827
Int. Cl.[2] G06K *19/06*
U.S. Cl. 235—61.12 N 12 Claims



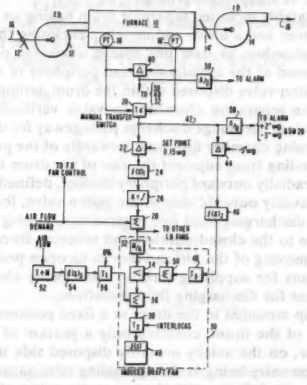
1. A machine readable record medium for storing data and having scannable indicia thereon comprising, in combination:
a record member for storing data;
a plurality of individual machine readable circular code marks whose centers lie on the circumference of at least one common circle on said record member, at least one of said circular code marks defining a marker for establishing a unique angular reference position for separating the beginning and the end of said circular code marks.

3,985,294

FURNACE PRESSURE CONTROL

Paul Vincent Guido, Cedar Grove, and Robert Lenox Criswell, Florham Park, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Aug. 4, 1975, Ser. No. 601,892
Int. Cl.[2] F23N *3/06*
U.S. Cl. 236—15 C 23 Claims



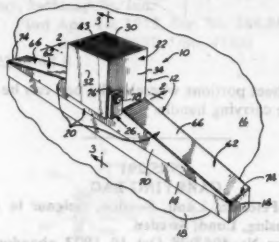
1. A control for regulating pressure excursions in a furnace having forced draft and induced draft fans for creating a desired flow of gasses through said furnace comprising:
pressure detector means located in the furnace being responsive to pressure therein for delivering an output indicative of said pressure;
means for producing a set point signal corresponding to a required furnace pressure range,
correction circuit means responsive to the pressure detector means output and the set point signal for delivering a correction output signal,
means for delivering a demand output corresponding to the desired gas flow through the furnace,
fan control circuit means coupled to at least one of said fans, responsive to said demand output and the correction signal for delivering a control signal, said fan so coupled to the fan control circuit means to be responsive to variations in said control signal to modify the flow of gas through the furnace accordance therewith.

3,985,295

HEAT COLLECTOR AND DIFFUSER

Robert C. Monninger, 110 N. Coolidge, Normal, Ill. 61761

Filed Mar. 17, 1975, Ser. No. 559,170
Int. Cl.[2] F24F *11/08*
U.S. Cl. 236—38 7 Claims



1. A heat collector and diffuser apparatus for installation over an existing room heating system employing elongated fin tube radiators for controlling the distribution of heat therefrom and for providing a more uniform environmental heating of the room or space, said apparatus comprising:
housing means adapted to be placed over said elongated radiator in nested relationship thereto, said housing means having an outlet means for exhausting air to the room at the upper end of said housing means,
said housing means enclosing the upper portion of said radiator and excluding outside air,
blower means associated with said housing means for inducing air flow across said fin tube radiator and through said housing for exhausting said air flow through said outlet means,
thermostat means for controlling said blower means in accordance with a desired room temperature, and
elongated collector ducts on said housing means for nesting superimposition over and for resting on an elongated fin tube heat exchanger for collecting air flowing across said fin tube radiator and an inlet means associated with said collector ducts for disposition substantially across the fin tube radiator to collect hot air thereacross as induced by said blower means to flow into and through said collector ducts to said blower means.

5. A heat collector and diffuser apparatus for use with room heating systems employing elongated fin tube radiators for controlling the distribution of heat therefrom and providing a more uniform heating of the room or space, said apparatus comprising:
housing means having lower inlet means and upper outlet means, said housing means including a central upright blower section with a top and a bottom, said upper outlet means provided in said top and a bottom opening provided in said bottom. a tapered outrigger collector duct depending from said bottom of said upright section and extending beyond each side thereof for overlying substantially the length of said fin tube radiator,
electric blower means disposed within said upright section, said blower means directed to discharge air through said outlet means and adapted to suction air into said bottom opening,

thermostat means co-operative with said electric blower means for selective energization thereof,

said outrigger collector ducts co-operative with said bottom opening of said upright blower section for channeling air therethrough, and

walls on said outrigger ducts defining an elongated opening in the bottom thereof to receive in nesting relationship substantially the entire length of said fin tube radiator for drawing air across said radiator and for channeling said air into said central upright blower section for forced exhaust by said electric blower means through said outlet means and into the room or space.

3,985,296

STEAM TRAP WITH BIMETAL VALVE CONTROL

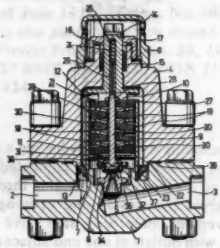
Katsuji Fujiwara, Hiraoka 191, Nishitani, Kakogawa, Hyogo, Japan

Filed Apr. 10, 1975, Ser. No. 566,715

Claims priority, application Japan, Aug. 29, 1974, 49-99267

Int. Cl.² F16T 1/04

U.S. Cl. 236—59 **11 Claims**



1. A steam trap including a fluid inlet port, a fluid outlet port, valve means for controlling fluid flow through said steam trap from said inlet port to said outlet port and a bimetallic assembly responsive to temperature variations for controlling opening and closing of said valve means, said bimetallic assembly comprising a plurality of bimetallic members having insert means separating each of said bimetallic members from a next adjacent bimetallic member, said bimetallic assembly being configured as an elongated stack with said bimetallic members arranged to vary the length of said stack by temperature responsive movement of each of said bimetallic members between a first position at a higher temperature and a second position at a lower temperature, said bimetallic members and said inserts being arranged to effect variation in the length of said stack when said bimetallic members move between said first and said second positions, and means interconnecting said bimetallic assembly with said valve means to open or close said valve means in response to movement of said bimetallic members between said first and said second positions, both said bimetallic members and said insert means comprising a generally annular curved configuration with said bimetallic members being configured with a convex side and a concave side and adapted to reverse said concave side and said convex side thereof when moving between said first and second positions, the curvature of said bimetallic members generally conforming to the curvature of said insert means when said bimetallic members are in one of said first and said second positions.

3,985,297

POWDER PAINTING APPARATUS

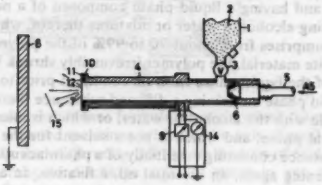
Tsutomu Itoh, Tokyo, Japan, assignor to Onoda Cement Company, Ltd., Japan

Filed July 3, 1975, Ser. No. 593,168

Claims priority, application Japan, July 10, 1974, 49-78221

Int. Cl.² B05B 5/02

U.S. Cl. 239—15 **9 Claims**



8. An electrostatic powder painting apparatus in which a powder paint injection opening in a body to be painted are disposed in opposed relationship comprising:

a nozzle having a powder injection opening,

a pair of ring-shaped electrodes extending around said injection opening and positioned only adjacent said injection opening, and insulated with respect to one another by a relatively thin insulator covering at least one of said pair of electrodes,

a source of relatively high voltage alternating current power coupled to said pair of ring-shaped electrodes for providing a silent discharge between said electrodes to charge particles passing from said injection opening, and

a direct voltage source coupled between a work piece and said ring-shaped electrodes for applying an electrical field between said ring-shaped electrodes and a work piece which is independent of the discharge field provided by said alternating current source.

3,985,298

CONTROLLED RELEASE MATERIALS AND METHOD OF USE

Larry D. Nichols, Arlington, Mass., assignor to Moleculon Research Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 518,797, Oct. 29, 1974, which is a continuation-in-part of Ser. No. 363,267, May 23, 1973, Pat. No. 3,846,404. This application Nov. 1, 1974, Ser. No. 519,812

Int. Cl.² A61L 9/04

U.S. Cl. 239—54 **20 Claims**

1. A process for controlling the duration and rate of release of a material, which process comprises:

a. providing a polymer-liquid composite material composed of a cellulosic polymer phase and a cellulosic nonsolvent liquid phase, which is a solvent for the material to be impregnated, comprising from about 70 to 99% of the material, the material characterized by being ultramicroporous, with interconnecting pore sizes of from about 10 to about 250 Angstroms and subject to irreversible shrinking on evaporation of the liquid phase;

b. impregnating the said material with a substance which is desired to be released at a controlled rate and for a desired period of time by contacting the substance with the said material to provide for a diffusive exchange between the liquid phase and the substance, the substance a liquid in pure form or in solution which is miscible with the liquid phase, and which is not a solvent for the polymer, thereby placing the substance within the interior pores of the material, the substance consisting essentially of a pharmaceutical agent, a sweetening agent, an essential oil, a perfume fixative, an antiperspirant, a dye, a dermatological agent, a fragrance, a pesticide or a fertilizer;

c. recovering the substance-impregnated material; and
d. incorporating the impregnated material into the environment in which the controlled release is desired, and releasing the impregnated substance from the material.

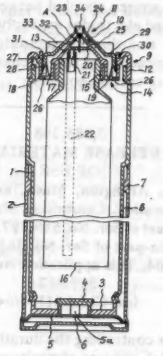
20. A controlled release polymer-liquid composite material which comprises a cellulosic polymer of cellulose triacetate or cellulose nitrate or a discrete or molecular mixture thereof with a particle size of from about 1 to 500 microns, the polymer characterized by a plurality of ultramicroporous interconnecting pores having a size of from about 10 to 250 Angstroms, and having a liquid phase composed of a nonsolvent comprising alcohol or water or mixtures thereof, which liquid phase comprises from about 70 to 99% of the polymer-liquid composite material, the polymer irreversibly shrunk by evaporation of the liquid phase from its condition prior to diffusion the liquid phase containing a diffused substance therein which is soluble with the alcohol or water, or which is miscible with the liquid phase, and which is not a solvent for the polymer, the substance consisting essentially of a pharmaceutical agent, a sweetening agent, an essential oil, a fixative, an antiperspirant, a dye, a dermatological agent, a fragrance, a pesticide or a fertilizer, which substance, within the liquid phase of the pores, is released over a period of time.

3,985,299

SPRAY HEAD

Jean Brenez, Pessac, France, assignor to Societe des Plastiques BRENEZ, France

Filed June 12, 1975, Ser. No. 586,303
Claims priority, application France, Nov. 29, 1974, 74.41060
Int. Cl.² B05B *15/02, 7/26*
U.S. Cl. 239—119 **8 Claims**



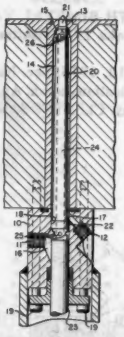
1. A spray head for an atomization diffuser comprising a first part adapted to be mounted to said spray diffuser and having at its centre a frusto-conical portion, said frusto-conical portion having a small base provided with two orifices, one of said orifices having equipped with a union, said frusto-conical portion having an internal skirt threadingly engageable with a neck of a bottle serving as a reservoir for a product to be sprayed, a tube mounted on said union and extending into said bottle; a second conical part mounted on said small base of said frusto-conical portion and having an axial passage; and a third conical part mounted on said first part and surrounding said frusto-conical portion which is surmounted by said second part, said third part having a tip provided with a spraying aperture, said third part being spaced from said first and second parts forming an air-inlet chamber into which air enters through at least one orifice arranged in said first part and allowing said air-inlet chamber to communicate with the interior of the spray diffuser, said internal skirt on the first part comprising at least one annular groove communicating with said air-inlet chamber and having a wall which is at least partly flexible and is capable of shutting off the communication between said orifice, arranged in said first part and said air-inlet chamber.

3,985,300

SELF-PURGING INJECTION VALVE

Baden McDowall Pinney, Kingston, Canada, assignor to Du Pont of Canada Limited, Montreal, Canada

Filed Mar. 24, 1975, Ser. No. 561,437
Claims priority, application Canada, Aug. 1, 1974, 206289
Int. Cl.² B05B *15/02*
U.S. Cl. 239—119 **3 Claims**



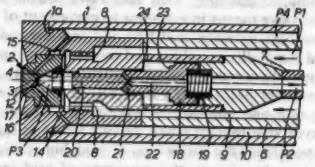
1. In a valve including a valve body having a supply port and an injection port connected by an elongated injection port barrel passage and a valve stem extending through said barrel and slidable therein for closing and opening said injection port, the improvement comprising: said valve stem having an internal passage with outlets at one end adjacent said injection port and inlets at the other end adjacent said supply port; said body having a purging port in communication with said body barrel passage located between the supply port and the injection port; and sealing means on said valve stem for providing a flow passage from said supply port through the valve stem inlets into the internal passage of the valve stem, out through the valve stem outlets into the valve body barrel passage and out the purging port when the valve stem is in the position closing said injection port.

3,985,301

MULTI FLUID INJECTORS

David Tindall, Datchet, England, assignor to Spectus Oil Burner, Ltd., Ascot, England

Filed Jan. 13, 1975, Ser. No. 540,545
Claims priority, application United Kingdom, Jan. 18, 1974, 2589/74
Int. Cl.² B05B *1/32, 9/00*
U.S. Cl. 239—126 **21 Claims**



1. Fluid injector apparatus, comprising

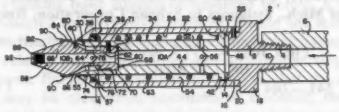
a. a hollow injector body (1) containing at one end a discharge chamber (12) and including at least one discharge orifice (13; 17) for discharging fluid from said discharge chamber;
b. liquid supply passage means (9, 8) contained in said injector body for supplying liquid to said discharge chamber;
c. liquid return passage means (7) contained in said injector body for returning liquid from said discharge chamber;
d. gas supply passage means (10, 14) contained in said injector body for supplying a gaseous fluid adjacent said discharge orifice;
e. means causing the pressure (P3) of the fluid in said discharge chamber to be less than the pressure (P2) in said return passage means, whereby a portion of the liquid in said discharge chamber is discharged via said discharge orifice; and
f. means causing the pressure (P4) of the fluid in said gas supply passage means to be greater than the pressure (P3) of the fluid in said discharge chamber, whereby the gaseous fluid is discharged via said discharge orifice in mixed relation with the discharged liquid portion.

3,985,302

VARIABLE TWO STAGE AIR NOZZLE

Alain Frochaux, Boston, Mass., assignor to Barry Wright Corporation, Watertown, Mass.

Filed June 12, 1975, Ser. No. 586,215
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.² B05B *7/08, 1/30;* **F01N** *1/10, 1/14*
U.S. Cl. 239—424 **15 Claims**



1. A high-thrust low-noise nozzle adapted to effect movement of a secondary fluid by a pressurized primary fluid comprising, tubular means forming a passageway having an entrance and an exit orifice, said entrance being adapted for connection to a source of pressurized primary fluid, at least one port communicating with the passageway between said entrance and exit orifice, means cooperating with said port for directing flow of primary fluid from said port along the outside of said tubular means in a direction so as to induce flow of a secondary fluid along the outside of said tubular means toward said exit, noise-reducing means positioned in said passageway between said exit orifice and said port for effecting substantially laminar flow of the stream of pressurized primary fluid discharged from said exit orifice, said noise-reducing means creating sufficient back pressure to force some of the pressurized primary fluid to flow out of said passageway via said port, and means for varying the length of the outside of said tubular means over which secondary fluid flows as a function of the input flow of said primary fluid.

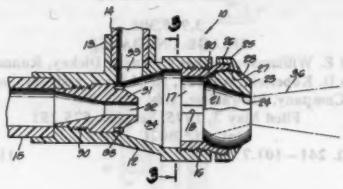
3,985,303

HYDROMASSAGE DEVICE WITH DIRECTIONAL JET CONTROL

Wayne D. Steimle, 8808 E. Las Tunas Drive, San Gabriel, Calif. 91776

Filed Oct. 9, 1975, Ser. No. 621,048
Int. Cl.² B05B *7/04, 15/08;* **A61H** *9/00;* **F16L** *27/06*
U.S. Cl. 239—428.5 **12 Claims**

1. That improvement in a hydromassage device for use under submerged conditions comprising: a tubular fitting provided with means for connecting the same to the submerged outlet of a pressurized water supply conduit, the outer end of said fitting having a spherical socket adjustably seating an eyeball water outlet fitting having a spherical exterior surface journalled in said socket and a conical bore therethrough which converges toward the outlet end thereof, and



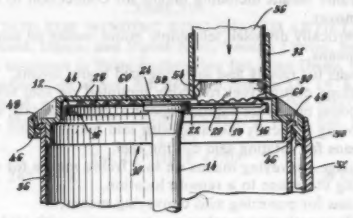
clamping ring nut means for holding said eyeball fitting in any of many adjusted positions wherein the axis of said conical bore is adjusted differently relative to the axis of said tubular fitting thereby to discharge a jet of water in any of many selected directions.

3,985,304

ROTARY FOOD PROCESSING APPARATUS

Carl G. Sontheimer, 14 Gray Oaks Lane, Greenwich, Conn. 06830

Filed Apr. 14, 1975, Ser. No. 567,732
Int. Cl.² B02C *18/12*
U.S. Cl. 241—92 **7 Claims**



1. In rotary food processing apparatus having an upright working bowl with a vertical motor-driven shaft extending up into the bowl with its axis of rotation extending along the central axis of the bowl and in which a cover is secured in position extending across the top of the bowl in use, such cover including an upright feed tube which is offset entirely to one side of said axis of rotation, said feed tube serving for introducing food items down therethrough into the top of the bowl and in which a rotary tool has an elongated hub removably engaging down upon said drive shaft in driving relationship therewith and has a horizontal disc-like cutting member secured to the top of said hub which rotates about said axis of rotation in use, said disc-like cutting member having a horizontal area with a downturned flange around the perimeter thereof and with cutting means thereon projecting above the upper surface of said horizontal area, the improvement comprising means for preventing said cutting means from engaging the undersurface of the cover on the opposite side of the axis of rotation from said feed tube, said means including a bearing element positioned on said horizontal disc-like cutting member near said downturned flange, said bearing element being located near said cutting means within an angular displacement of no more than 45° therefrom, said bearing element having a bearing surface elevated above said cutting means, said elevated bearing surface being smooth and being adapted to slide on the undersurface of the cover on the opposite side of the axis of rotation from said feed tube for holding said cutting means down away from the cover in the event that the user overloads the rotating disc-like member by pushing food items too vigorously down through said offset feed tube caus-

ing the sector of the rotating disc-like member beneath said feed tube to deflect downwardly while the opposite sector of the disc-like member on the opposite side of the axis tends to be correspondingly deflected upwardly.

3,985,305

SILAGE UNLOADER

Gerald E. Williamson, Ankeny; Wayne Dickey, Runnells, and Ross D. Koberlein, Ankeny, all of Iowa, assignors to Koehring Company, Milwaukee, Wis.

Filed May 7, 1975, Ser. No. 575,251
Int. Cl.² B02C *18/06*
U.S. Cl. 241—101.7 **11 Claims**

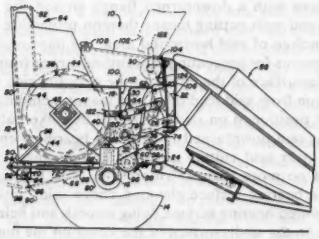
1. A silage unloader comprising,
a frame means including means for connection to a prime mover,
a vertically disposed telescopic boom means on said frame means,
means for raising and lowering said boom means,
a silage cutting reel rotatably mounted on said telescopic boom means for rotation about a horizontal axis, said reel being vertically movable with said boom means,
means for rotating said cutting reel,
a silage conveying means on said frame means for conveying cut silage to a remote location,
means for powering said conveying means,
a silage gathering mechanism cooperating with said reel for gathering the silage cut by said reel and for supplying the silage to said conveying means.

3,985,306

FACILITATING EASY ACCESS TO A SHEARBAR ON A FORAGE HARVESTER

Robert A. Wagstaff, New Holland, and Henry N. Lausch, Denver, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 15, 1975, Ser. No. 605,099
Int. Cl.² B02C *18/06, 18/22*
U.S. Cl. 241—222 **37 Claims**



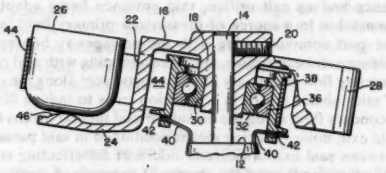
1. In a forage harvester, the combination comprising:
a housing;
a rotatable cutterhead mounted in said housing;
a shearbar mounted in said housing forwardly of and closely adjacent to said cutterhead and cooperable therewith for comminuting crop material;
front and rear upper rotatable feed rolls generally tandemly-arranged and supported in said housing forwardly of said cutterhead and said shearbar, said rear roll being disposed in close proximity to and forwardly of said cutterhead and shearbar when said rear roll is in a lower operative feeding position;
lower feed means mounted in said housing and cooperable with said upper feed rolls for conveying crop material to said cutterhead across said shearbar;
means mounting said rear feed roll for pivotal movement from said lower operative feeding position to an upper inoperative position generally above said front feed roll and remote from said cutterhead and shearbar to thereby expose and render said shearbar readily accessible for servicing or the like;
tensioning means coupled to said mounting means; and
actuatable means mounted to said housing and connected to said tensioning means, said actuatable means being movable to a first position for placing said tensioning means in a first condition in which said rear feed roll is biased toward its lower position, said actuatable means also being movable to a second position for placing said tensioning means in a second condition in which said bias on said rear feed roll is relaxed for facilitating movement of said rear feed roll to its upper position.

3,985,307

MECHANICAL DEVICE TO MIX AMALGAM

Robert Ebbert, Rochester, and Harold H. Simpson, Fraser, both of Mich., assignors to Sybron Corporation, Rochester, N.Y.

Filed June 9, 1975, Ser. No. 584,745
Int. Cl.² B02C *17/08*
U.S. Cl. 241—284 **7 Claims**

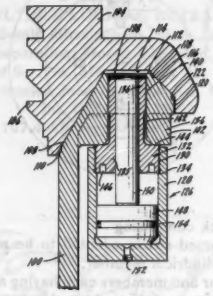


1. An amalgam producing machine comprising:
a. an armature disposed in a plane making an acute angle with the horizontal and rotatable about an upright axis, said armature having a mulling cup receiving portion at one end;
b. a motor for rotating said armature;
c. a pulley coaxially journaled to said armature and fixed against rotation said pulley being disposed beneath said armature and in a plane generally parallel to the plane of said armature;
d. an endless belt disposed about said pulley and extending to said receiving portion for placement about a mulling cup located at said portion; and
e. an upright roller journaled to said armature at said receiving portion providing positioning means for said mulling cup.

3,985,308
CLEARANCE SYSTEM FOR CRUSHERS

D. Carter Davis, Menomonee, and Ulhas S. Sawant, Sussex, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed May 27, 1975, Ser. No. 580,924
Int. Cl.² B02C 2/04
U.S. Cl. 241—290 7 Claims



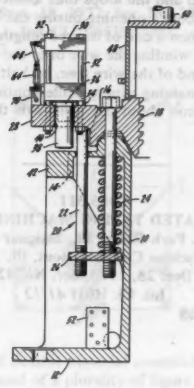
1. In a gyratory crusher, a generally upright main frame with an outstanding circumferential flange at the upper end thereof, an adjustment ring mounted on the main frame flange with a crushing bowl adjustably mounted therein, a crushing head mounted for gyratory movement within the main frame opposite the bowl and defining a crushing cavity therewith, a spring release yieldably holding the adjustment ring on the main frame flange but arranged to yield so that the crushing cavity may be cleared of uncrushable material, the spring release including a single row of coil springs being centered on a circle about the outside of the main frame under the main frame flange, and a clearance system for the crusher including a fluid-operated jacking system between the main frame flange and the adjustment ring so that the adjustment ring and bowl may be lifted to clear the crushing cavity, the jacking system including a plurality of fluid jacks positioned under and socketed into the main frame flange with the jacks being centered on the same circle as and interposed at intervals among the springs.

3,985,309
CRUSHER CLEARING SYSTEM

D. Carter Davis, Menomonee Falls, and Ulhas S. Sawant, Sussex, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed May 27, 1975, Ser. No. 581,036
Int. Cl.² B02C 2/04
U.S. Cl. 241—290 10 Claims

1. In a gyratory crusher, a generally upright circumferential main frame for enclosing a gyratable crushing head, an outstanding circumferential flange on the upper end of the main frame, an adjustment ring on the main frame flange adapted to support a crushing bowl in a position opposite the crushing head to thereby define a crushing cavity, a release yieldably holding the adjustment ring, and the bowl, down on the main frame and constructed to be overcome thereby allowing the adjustment ring and bowl to rise so that uncrushable material may pass between the head and bowl, and a jack system effective between the main frame flange and the adjustment ring including a plurality of jacks arranged in pairs, the pairs being generally equidistantly positioned about the crusher with each pair being disposed to apply an upthrust between the adjustment ring and main frame flange, and means for selectively energizing certain of the pairs and not others, depending upon the circumferential location of a jam in the crushing cavity, so

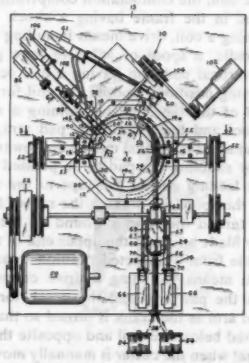


that the adjustment ring may be controllably tilted to clear the side of the crushing cavity that is jammed.

3,985,310
METHOD FOR WINDING RING-SHAPED ARTICLES

Bryan Kent, Ithaca, and Duane Kent, Vernon Center, both of N.Y., assignors to Pulse Engineering Inc., San Diego, Calif.

Continuation of Ser. No. 341,536, March 15, 1973, abandoned, which is a division of Ser. No. 120,960, March 4, 1971, abandoned. This application Oct. 7, 1974, Ser. No. 512,852
Int. Cl.² H01F 41/08
U.S. Cl. 242—4 R 20 Claims



1. In a method of winding wire having a free end onto a core having a central opening including the steps of forming the wire into a coil having a plurality of generally circular loops through the core's opening, each loop being formed in sequence about the coil's central axis radially inwardly of the loops previously formed so the coil has a thickness along this axis of less than two wire diameters and thereafter winding the wire onto the core by circulating the loops through the core's opening about the coil's axis, the improvement comprising;

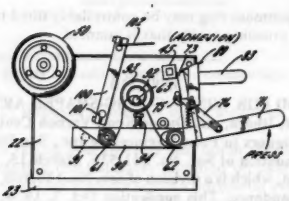
the steps of providing a continuous wire supply, feeding a portion of the wire with its free end leading the way, from the supply into a coil of loops through the core's opening from a point which is radially inwardly of the loops in the coil, circulating the free end and the loops thus formed about the coil's axis through the core's opening during the wire feeding step and thereafter, when a coil of desired length has been formed through the core, winding the wire onto the core, while maintaining the free end of the wire free, by halting the feeding of wire from the remaining supply while continuing to circulate the loops in the coil about the coil's axis through the core's opening.

3,985,311

HAND OPERATED TAPING MACHINE FOR COILS

Donald J. Stuart, Park Ridge, Ill., assignor to Midland Engineering and Machine Co., Rosemont, Ill.

Filed Dec. 28, 1973, Ser. No. 429,283
Int. Cl. H01f 41/12
U.S. Cl. 242—7.08 **15 Claims**



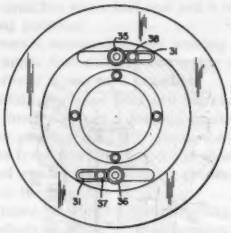
1. In a hand operated taping machine for winding protective tape upon a wire coil, the combination comprising a frame, a spindle journaled in the frame having a chuck at the end thereof for gripping a coil, drive means including a crank for rotating the spindle, a spool of adhesive tape providing a leading end, a vertical pad arm having a pad occupying an initial tape-applying position opposite the coil for supporting the leading end of the tape, means defining a run of tape between the spool and the pad on the pad arm, means for mounting the pad arm for manual movement toward and away from the coil for enabling the pad to be pressed against the coil to tack the leading end of the tape to the coil, means associated with the spool for braking the run of tape so that as the crank is turned the tape is wound on the coil under tension, a cutter blade adjacent the upper end of the pad and manually movable from a retracted position to an extending cutting position, means including a drive connection connected between the pad arm and the crank for (*a*) bodily lowering the pad arm as the crank is turned so that the cutter blade is positioned below the coil and opposite the tensioned run of tape so that when the cutter is manually moved the tape is severed to form a tail end and a new free end and for (*b*) raising the pad arm back to its initial position opposite the coil, anti-retrograde means associated with the pad for insuring that the free end upon being severed remains on the pad in readiness for tacking to a new coil, and means operated by the crank for elongating the run of tape during the lowering of the pad arm and for shortening the run during the raising of the pad arm so as to create a small amount of slack in the run so that when the leading end of the tape is tacked to a new coil it is free of any tendency to pull off during the initial rotation of the coil.

3,985,312

DRIVE CHUCK

Alexander Lovell Parker, Tenafly, N.J., assignor to Accurate Machine and Engineering Co., Hackensack, N.J.

Filed Dec. 2, 1975, Ser. No. 636,825
Int. Cl.² B65H 75/18
U.S. Cl. 242—72 R **7 Claims**



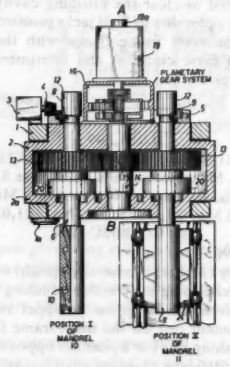
1. A drive chuck comprising
at least one curved sleeve adapted to be mounted on an essentially cylindrical member;
a pair of circular end members each having at least one slot therein in the area of the end member between its axis of rotation and the edge of said end member;
a pin moveably fitted in said slot and passing through the passage in said sleeve so as to hold said sleeve and end members together as a unit and to induce radial movement of said sleeve in response to rotation of said unit.

3,985,313

REEL SYSTEM

Konrad Klein, Dortmund-Wambel; Hans Wladika, and Theodor Sevenich, both of Dortmund, all of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Germany

Filed July 29, 1975, Ser. No. 600,074
Claims priority, application Germany, Aug. 2, 1974, 2437237
Int. Cl.² B21C 47/02
U.S. Cl. 242—78.1 **8 Claims**



1. In an apparatus for reeling up strip material, especially steel strip, and for unloading wound up reels therefrom; a frame, a housing rotatable in the frame and having a pair of winding up spindles journaled therein in spaced parallel relation and extending axially from one side of the housing, a shaft rotatable in the housing on the axis of rotation of the housing and having a drive gear fixed thereto in said housing, a driven gear in the housing for each spindle and meshing with the said

drive gear, a clutch in the housing for each spindle each having a first position in which the respective spindle is clutched to the housing and is unclutched from the pertaining driven gear and a second position in which the respective spindle is clutched to the respective gear and is unclutched from the housing, and means for rotating said housing about the axis of said drive gear to present said spindles selectively one to winding up position and the other to unloading position.

3,985,314

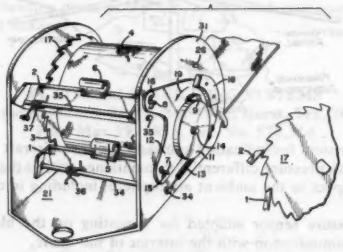
MULTIPLE LOCKING RETRACTOR

Frederick C. Booth, Birmingham, Mich., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation of Ser. No. 276,867, July 31, 1972, abandoned. This application June 28, 1974, Ser. No. 485,392

Int. Cl.² A62B *35/02*

U.S. Cl. 242—107.4 A **9 Claims**



1. In a safety belt retractor, the combination comprising:

a. support having two parallel walls;

b. a reel adapted for connection with a seat belt, journaled in the support for axial rotation in a wind direction and in the opposite unwind direction, said reel having at least one circular flange with ratchet teeth in its periphery;

c. at least two pawl bars, each arranged for independent locking engagement with the reel in the unwind direction, each pawl bar having an elongated member, said elongated member having a longitudinal axis disposed substantially parallel to said reel, said elongated member having a length approaching the distance between said parallel walls of said support, said elongated member having a locking edge extending substantially across the distance between said parallel walls for engagement with said ratchet teeth of said at least one flange located adjacent to either of said parallel walls, the pawls of said pawl bars being positioned out-of-phase with respect to the ratchet teeth, whereby when said pawls are biased in position for locking engagement with the ratchet teeth, and at least one pawl is in full locking engagement therewith, at least one pawl is not in full locking engagement therewith;

d. means for restraining the pawls against their bias to permit withdrawal of the belt, said restraining means comprising at least two web followers, one web follower mounted on each pawl bar, at least two cam followers, one cam follower mounted on each pawl bar, and at least two clutch arms mounted on a common clutch means, one clutch arm cooperating with each cam follower; and

e. means for triggering the pawls into position for locking engagement with the reel to prevent withdrawal of the belt, said triggering means comprising at least two cams mounted on a common cam means, one cam for each cam follower.

3,985,315

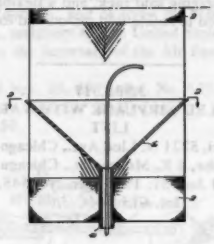
PACKAGE OF FLEXIBLE MATERIAL FOR TWISTLESS PAYOUT WITH WIDE FUNNEL GUIDE

James W. Newman, Scarsdale, N.Y., assignor to Windings, Inc., Goldens Bridge, N.Y.

Filed Sept. 18, 1972, Ser. No. 290,007

Int. Cl.² B65H *55/02*

U.S. Cl. 242—163 **7 Claims**



1. A package of flexible material constituted by a plurality of layers each formed of a plurality of figure 8's wound about a common axis with the cross-overs of each layer progressing around the package and having an axial opening therein and a radial opening extending from the periphery of the package to the axial opening, through which radial opening the inner end of the material is led out, a funnel mounted within the axial opening with its axis directed radially of the package and aligned with said radial opening, the mouth of the funnel having a dimension in the axial direction of the package at least substantially as great as the axial dimension of the package.

3,985,316

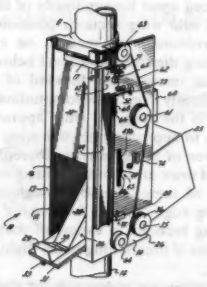
TERMINAL FOR PNEUMATIC CARRIER SYSTEM

Adam Weissmuller, Pompton Plains, N.J., assignor to The Mosler Safe Company, Hamilton, Ohio

Filed Apr. 16, 1975, Ser. No. 568,728

Int. Cl.² B65G *51/32*

U.S. Cl. 243—19 **31 Claims**



1. A pneumatic transport terminal adapted for the receipt and dispatch of article carriers from and to a single pneumatic transport tube, said terminal including:

an opening in one side of the terminal;

a door for selectively opening and closing said opening;

a carrier-supporting cradle means movable mounted within the terminal, said cradle movable along a path between a retracted position adjacent a side of the terminal opposite the door, and a presentment position across the terminal wherein the cradle means extends at least partially through the opening, said tube connected to said terminal

so as to present an incoming carrier along a carrier path within said terminal in a central area thereof between said opening and said opposite side;

common drive means for opening and closing the door and for driving the cradle means for said retracted position to said presentment position, when the door is opened, and from said presentment position to said retracted position when the door is closed; and

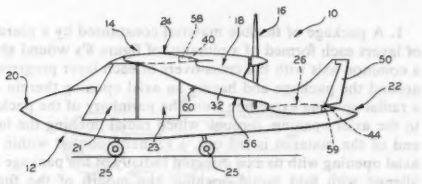
a rack connected to said cradle means, a rotatable pinion drivingly engaging said rack, and a flexible driving member connected to rotate said pinion and to open and close said door.

3,985,317

SHORT COUPLED AIRPLANE WITH VARIABLE WING LIFT

Alexander Geraci, 5221 N. Lind Ave., Chicago, Ill. 60630, and Joseph DeLouise, 6 E. Monroe St., Chicago, Ill. 60606

Filed Jan. 31, 1975, Ser. No. 545,971
Int. Cl.² B64C *3/06*
U.S. Cl. 244—13 **13 Claims**



1. In an aircraft including a fuselage having a wing structure and power means for propelling same, the improvement wherein:

said wing structure comprises:

a plurality of wing sections of substantially equal lengths and wing chords extending transversely of the fuselage,

with the forwardmost wing section being located forwardly of, and above the level of, the center of gravity of the aircraft,

and with the rearwardmost wing section being located rearwardly of, and below the level of, the aircraft center of gravity,

said wing sections, on either side of the aircraft, being uniformly spaced apart longitudinally of the fuselage,

with those of said wing sections positioned rearwardly of said forwarrdmost wing section, on either side of the aircraft, being disposed at a level below the level of the wing section immediately forward of same, and being spaced uniformly from same longitudinally of the fuselage a distance in the range of from approximately one half wing chord to approximately one wing chord, to be substantially free of the slipstream thereof along the length of same and draw air from the trailing edge thereof, along the length of same, thereby straightening out forward wing trailing edge vortices for making the total wing lift of said wing sections in excess of that possible for said wing sections if functioning in air flight independently of each other,

said wing sections, on either side of the air craft, having their projecting ends connected by vertically disposed air foils,

said air foils being disposed in vertical planes that parallel the longitudinal axis of the fuselage,

whereby wing tip vortices are reduced,

each of the trailing edges of said air foils having a rudder pivotally connected thereto to pivot about vertically disposed axes,

said wing sections each including on either side of the fuselage, and along the trailing edges of same, an eleflap mounted to pivot about an axis paralleling the respective wing sections,

means for moving said eleflaps in unison in the same direction about their respective axes to increase and decrease wing section lifts for effecting vertical movement of the aircraft free of substantial departure from level flight,

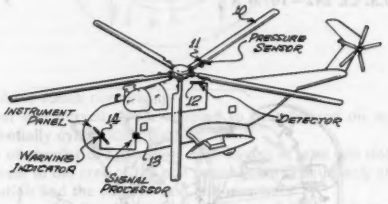
and means for moving said rudders in unison in the same direction about their respective axes to steer the aircraft.

3,985,318

HELICOPTER BLADE CRACK INDICATOR

Sam C. Dominey, Glendora, and John J. Mahoney, San Bernardino, both of Calif., assignors to Tyco Laboratories, Inc., Pomona, Calif.

Filed Nov. 14, 1975, Ser. No. 631,833
Int. Cl.² B64C *27/00*
U.S. Cl. 244—17.11 **16 Claims**



1. A system for indicating cracks in a hollow aircraft blade, wherein a pressure differential is maintained within the blade with respect to the ambient atmosphere, including in combination:

a pressure sensor adapted for mounting on the blade in communication with the interior of the blade,

said sensor including a member movable between a first position for a higher pressure differential and a second position for a lower pressure differential;

a radiation source mounted on said member;

a radiation shield positioned adjacent said member and having a radiation window, with said source disposed for radiation transmission through said window when said member is in said second position;

a radiation detector adapted for mounting on a non-rotating portion of the aircraft for receiving radiation from said source through said window; and

circuit means having the output of said detector as an input and providing an output varying as a function of the position of said member.

12. A method of continuously indicating the condition of a hollow aircraft blade while in flight, including the steps of:

sealing the blade with a pressure differential therein with respect to the ambient atmosphere;

detecting a reduction in the pressure differential;

moving a radiation source on the blade between a shielded position for a higher pressure differential and an unshielded position for a lower pressure differential;

detecting radiation from the blade at a fixed location on the aircraft; and

providing a warning signal when the detected radiation increases.

3,985,319

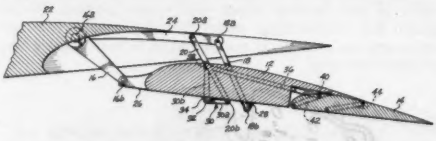
VARIABLE PIVOT TRAILING EDGE FLAP

Roy Delmar Dean, and Richard Herschel Welland, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 3, 1975, Ser. No. 546,578
Int. Cl.² B64C *9/20*
U.S. Cl. 244—42 DB **4 Claims**

1. In an airplane wing having a double variable flap comprising: a flap having two parts comprising leading and trailing parts capable of movement with respect to each other, a

four-bar linkage with a fore and aft bar extending from wing support structure to the leading part of the flap, a pivotable linkage extending from wing support structure to an actuation pivot point located such that the actuation pivot point remains in a constant position with respect to the leading part of the flap when the flap translates between cruise and take-off position, and means for imparting relative movement between



the leading and trailing parts of the flap through movement of the actuation pivot point with respect to the leading part of the flap once the flap translates further toward landing position, wherein the means for imparting relative movement between the leading and trailing parts of the flap through the pivot point includes means for converting downward movement of the actuation pivot point into a rearward movement of a control linkage.

3,985,320

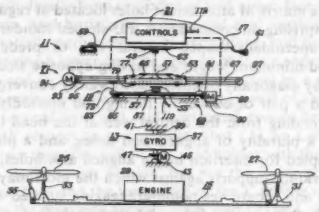
PLATFORM STABILIZING SYSTEMS

de Cordova Maxwell Brady, Box 1111, Hurst, Tex. 76053

Filed May 19, 1975, Ser. No. 578,514

Int. Cl.² B64C *17/00, 17/06*

U.S. Cl. 244—93 **9 Claims**



1. Apparatus for stabilizing a platform comprising:

a. a stabilizing gyroscope including a substantially horizontal rotor for stabilizing said platform and adapted for converting a disturbing force into a precessing force;

b. a frame carrying said stabilizing gyroscope securely mounted without gimbals at a set first location such that the axis of the rotor of said gyroscope is fixed with respect to said frame so as to effect a dominant precessing force offset 90° in the direction of rotation responsive to said disturbing force at a first azimuth that induces a torque force on said axis of rotation in any direction from zero to 360° in a horizontal plane about a predetermined center of said platform;

c. a load carrying compartment;

d. shifting means for shifting said load carrying compartment to move its center of gravity to a plurality of successive second locations and azimuths with respect to said frame to offset to a desired degree the torque force and the reactive precessing force; said shifting means carrying said load carrying compartment and being carried by said frame; and

e. control means for detecting a slight change in attitude of said platform from a desired attitude, and a second azimuth of a force effecting a raising of a portion of said platform and causing said change in attitude and effecting via said shifting means a controlled shifting of said load carrying compartment to a new second location along a third azimuth offset from said second azimuth 90° in a direction opposite the direction of rotation of said stabilizing gyroscope to establish the desired attitude; said control means being carried on said frame and connected with said shifting means so as to effect energization thereof for positioning said load carrying compartment at a new second location.

3,985,321

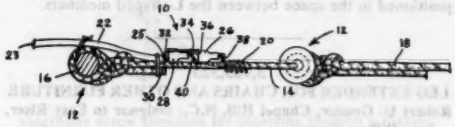
AUTOMATIC LINE RELEASE SYSTEM

Raymond D. Woolman, and Warren N. Massey, both of El Centro, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 25, 1975, Ser. No. 635,192

Int. Cl.² B64D *21/00*

U.S. Cl. 244—150 **10 Claims**



1. An automatic electrical line release system comprising an electrical cable located adjacent a line to be severed, said cable containing four wires therein, two of said wires being joined together at a first terminal end, the other pair of said wires being joined together at a second terminal end, a high resistance wire surrounding said line to be severed, said high resistance wire being connected at one end to said first terminal end and at the other end thereof to said second terminal, means for providing power to said line release system and means connected between said power supplying means and said four wire cable for energizing said line release system at a predetermined time.

3,985,322

ELECTRIC MOTOR MOUNTING FIXTURE

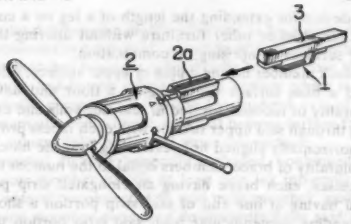
Kenichi Mabuchi, Tokyo, and Yoshihisa Tsuchimochi, Ichikawa, both of Japan, assignors to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed Apr. 21, 1975, Ser. No. 569,841

Claims priority, application Japan, May 11, 1974, 49-53389[U]

Int. Cl.² A63H *27/02;* **A47J** *7/14*

U.S. Cl. 248—5 **1 Claim**



1. A molded fixture for mounting an electromotor on a support member wherein the motor has a receiving portion including two L-shaped members which face each other with a space inbetween defining a generally T-shaped groove, said fixture comprising an elongated beam having first and second ends and upper and lower surfaces, first and second plate-like mounting portions having upper and lower surfaces, said mounting portions being formed integrally with said beam proximate said first and said second ends thereof for securing said fixture to a support surface, said upper surface of said first and said second mounting portions being coplaner with each other and perpendicular to the plane of said beam, a retaining wall formed integrally with said second end of said beam and

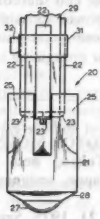
said second mounting portion, said retaining wall being perpendicular to the length dimension of said beam, a plate-like engaging portion formed integrally with said lower surface of said beam and extending from said retaining wall and said second mounting portion in a direction toward said first mounting portion, said engaging portion being in a plane that is parallel to and spaced from said first and said second mounting portions and perpendicular to the plane of said beam, said engaging portion terminating intermediate said first and said second ends of said beam and a laterally expanded portion formed integrally with said first end of said beam and extending from said lower surface of said beam to said lower surface of said first mounting plate, the width of said beam being slightly less than the space between the L-shaped members, the width of said expanded portion being slightly greater than the width of said beam and the space between the L-shaped members, said engaging portion being adapted to occupy the remaining part of the T-shaped groove when said beam is positioned in the space between the L-shaped members.

3,985,323

LEG EXTENDER FOR CHAIRS AND OTHER FURNITURE

Robert U. Gessler, Chapel Hill, N.C., assignor to Easy Riser, Inc., Wilton, Conn.

Filed Aug. 7, 1975, Ser. No. 602,898
Int. Cl.² F16M *11/20*
U.S. Cl. 248—188.9 **5 Claims**



1. A device for extending the length of a leg on a conventional chair, bed or other furniture without altering the leg exterior surfaces comprising, in combination:

a. a block member having a plan or upper surface, sidewalls and a base surface for engaging a floor and having a plurality of recesses formed in said sidewalls and extending through said upper surface with each recess providing a horizontally aligned hole extending into the block;

b. a plurality of brace members equal to the number of said recesses, each brace having an elongated strip portion and having at one end of said strip portion a short tail extending perpendicular from said strip portion the remainder of said strip portion having no projections therefrom, said tail being adapted to slidably fit into a respective said recess horizontal hole so that said strip portion will extend vertically from said hole and above said block member top surface; and

c. clamping means for urging said strip members inwardly towards one another and into engagement with the conventional leg exterior surfaces;

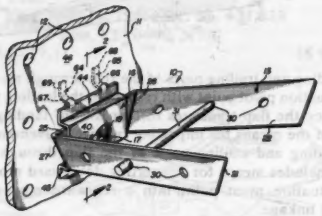
whereby the length of a chair, bed or other furniture leg may be extended by placing the end of said leg on said block member flat upper surface between said vertical strip members and securing said strip members to exterior portions of said leg by said clamping means.

3,985,324

TOOL HOLDER FOR PEGBOARD

Charles O. Larson, Sterling, Ill., assignor to Charles O. Larson Co., Sterling, Ill.

Filed Oct. 16, 1975, Ser. No. 622,968
Int. Cl.² A47F *7/00*; A47G *23/02*; F16M *13/00*
U.S. Cl. 248—223 **7 Claims**



1. A tool holder for mounting upon a planar bi-sided wall defining a matrix of attachment holes located at regular intervals, comprising, in combination, a U-shaped standard including a trapezoidally-shaped central web of predetermined width and minimum length and having opposite side margins defined by diagonally oriented, downwardly converging bend lines, and a pair of outwardly flaring and upwardly inclined arms extending from the central web at the bend lines, and defining a plurality of aligned arm holes, and a plurality of rods adapted for insertion in the aligned arm holes, the rods thus providing supports against which the tools may rest in a compact and secure yet noninterengaging stacked array, the holder further comprising a bracket including a platform having a width sufficient to cover the predetermined width of the standard web and a length substantially equal to the minimum length of the standard web so as to superimpositionally fit over the standard web without relative movement, top and bottom bases extending perpendicularly from the platform for a sufficient distance to provide head clearance spaced between a front wall surface and a back web surface for retention of a headed standard-bracket fastener, a threaded fastener having an enlarged head retained in the clearance between said wall surface and said standard web surface and a threaded shank of reduced diameter extending through registered holes in the standard web and bracket platform, a threaded fastener retainer for attachment to the threaded fastener at a position adjacent the bracket platform and having a thickness exceeding said head clearance space so as to indicate improper assembly of the tool holder parts to the holder user, the standard and web each defining additional holes which are misaligned to prohibit improper bracket-standard assembly, and a plurality of tabs extending from the bases for fastening the bracket and attached standard to the wall, the tabs including at least one bayonet tab extending from the bottom base perpendicularly to the bracket platform for insertion into a wall hole so as to prohibit bracket and standard motion in a plane parallel to the wall plane, and at least one hook tab having a hook shank extending perpendicularly to the bracket platform and a hook tip extending at an angle away from the hook shank so as to engage a back wall surface and to thereby retain the bracket, standard, and any held tools on the wall.

3,985,325

HOOK HOLDER

Stanley D. Ginsburg, Philadelphia, Pa., and Nicholas J. Castoria, Towaco, N.J., assignors to Diversified Marketing Group, Inc., Bellmawr, N.J.

Filed July 28, 1975, Ser. No. 599,683
Int. Cl.[2] A47F 5/00; F16B 45/00
U.S. Cl. 248—223 7 Claims

1. A holder for an L-shaped hook having a short leg and a longer leg, which comprises a body, a vertical circular bore through said body, the upper portion of said vertical bore having a larger diameter than the lower portion of said vertical bore, a horizontal groove in the upper face of said body extending longitudinally from one edge of said upper face to and into said bore, said horizontal groove and said vertical bore being substantially perpendicular to each other, said horizontal groove having a lower arcuate portion that is a segment of a first circle and an upper arcuate portion formed by a pair of opposed, diverging arcuate walls that are segments of a second circle, said vertical bore and said horizontal groove being so arranged with respect to one another that (1) an L-shaped hook of a larger diameter will fit into said holder with the short leg of the L in the upper portion, but not the lower portion, of the vertical bore and the longer leg of the L resting on and supported by the diverging arcuate walls, and (2) an L-shaped hook of a smaller diameter will fit into said holder with the short leg of the L extending through said upper portion of said vertical bore and into said lower portion of the vertical bore and the longer leg of the L resting in and supported by the lower arcuate portion of the horizontal groove.

3,985,326

BRACKET DEVICE

Nicholas Kittstein, Hoffman Station Road, Jamesburg, N.J. 08831

Filed Aug. 27, 1975, Ser. No. 608,026
Int. Cl.[2] A47F 5/00; F16M 11/12
U.S. Cl. 248—226 A 8 Claims

1. A bracket device for supporting an engineering instrument and for mounting on a column, comprising:

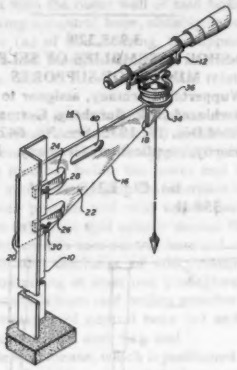
a first plate-like elongated body portion having substantially parallel planar side surfaces;

a second body portion integral with said first body portion and forming an extension of one end thereof;

first means integral with said second body portion and providing a coupling for supportingly mounting an engineering instrument on said extended one end of said first body portion;

second means formed on one of said side surfaces of said first body portion near the other end thereof for mounting said bracket device on a column; and

said first means including a cylindrical member having an aperture extending therethrough, said cylindrical member projecting from said second body portion and being



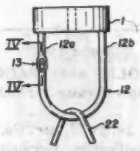
externally screw threaded for receiving thereon a mating base flange of an engineering instrument.

3,985,327

ROTATABLE HANGING DEVICE WITH OPENABLE SUSPENSION MEMBER

Leonard Holtz, Oceanside, N.Y., assignor to Turn-Up, Inc., Oceanside, N.Y.

Continuation-in-part of Ser. No. 491,819, July 25, 1974, Pat. No. 3,957,242. This application Apr. 4, 1975, Ser. No. 557,961
Int. Cl.[2] F16M 13/00
U.S. Cl. 248—318 13 Claims



1. A rotatable hanging device adapated to be mounted to a fixed, substantially horizontal mounting surface, comprising:

a main member having a substantially central bore therethrough and having a first bearing surface which is substantially perpendicular to the longitudinal axis of said substantially central bore, said first bearing surface facing said substantially horizontal mounting surface;

an elongated, flexible, generally U-shaped, nonhinged suspension member having at least one leg integrally and non-rotatably connected to said main member, said suspension member extending downwardly from said main member substantially symmetrically about said substantially central bore and normally defining in combination with said main member a closed loop, said suspension member passing through an extension of the longitudinal axis of said substantially central bore, said suspension member includng non-hinged locking means thereon for selectively opening and lockingly closing said normally closed loop to permit passage of an object to be hung through said loop; and

stationary mounting means extending through said substantially central bore of said main member for rotatably mounting said main member to said substantially horizontal mounting surface with said first bearing surface adja-

cent said substantially horizontal mounting surface, said main member being rotatably relative to said stationary mounting means.

3,985,328

PROP-AND-SHOE ASSEMBLIES OF SELF-ADVANCING MINE ROOF-SUPPORTS

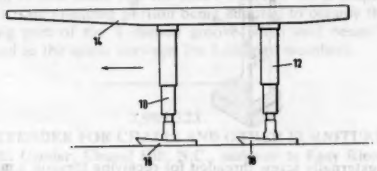
Hans Büll, Wuppertal, Germany, assignor to Hermann Hemscheidt Maschinenfabrik, Bornberg, Germany

Filed Dec. 19, 1975, Ser. No. 642,618

Claims priority, application Germany, Dec. 21, 1974, 2461011

Int. Cl.² E21D *15/44*

U.S. Cl. 248—354 H 6 Claims



1. A prop-and-shoe assembly of an hydraulic self-advancing mine roof support unit, comprising an hydraulic prop, a shoe operatively connected to an end of the prop, a bearing member adjacent the said end of the prop, a pivot on the shoe serving to pivotally support the said bearing member, a tubular portion of the prop slidably embracing the said bearing member, a chamber within said tubular prop portion permitting longitudinal displacement of the prop with respect to the shoe by the admission of hydraulic fluid under pressure into the chamber, an abutment adjacent the lower end of the said tubular prop portion, and a stop face on the shoe against which the said abutment is pushed by hydraulic fluid supplied to the said chamber during operation of the assembly whereby the prop is brought into a desired position with respect to the shoe.

3,985,329

COLLAPSIBLE MOLDS AND SPACERS THEREFOR

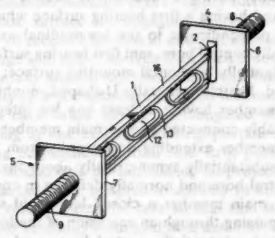
Karl Liedgens, Herchener Strasse 26, 5231 Weyerbusch, Germany

Filed Mar. 24, 1975, Ser. No. 561,065

Claims priority, application Germany, Mar. 28, 1974, 2414951

Int. Cl.² E04G *17/08*

U.S. Cl. 249—40 14 Claims



1. For use in a mold for concrete or the like, elongated spacer means for interconnecting mold plates and comprising an elongated spacer portion having opposed ends, a pair of holding plates situated at said opposed ends of said elongated spacer portion, and adapted to rest against inner surfaces of a pair of mold plates whose inner surfaces are directed toward each other, and a pair of flexible hinge means respectively interconnecting said holding plates with said spacer portion at said ends thereof for rendering said holding plates turnable with respect to said spacer portion about a pair of parallel axes, respectively, and a pair of fastening means respectively fixed to said holding plates and extending outwardly therefrom away from the spacer portion between said holding plates, said pair of fastening means being adapted to extend through openings of a pair of mold plates for fastening the latter to said holding plates, said spacer portion, holding plates, and flexible hinge means all being integral with each other and made of plastic material so as to form a single body of plastic material.

3,985,330

DISPOSABLE INNER MOULD FOR BOATS

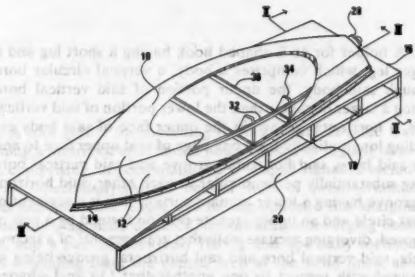
Jan William Dorfman, 173 Roxborough Ave. East, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 364,003, May 25, 1973, Pat. No. 3,832,745. This application May 30, 1974, Ser. No. 474,368

The portion of the term of this patent subsequent to Sept. 3, 1991, has been disclaimed.

Int. Cl.² B28B *7/32*; B63B *5/00*

U.S. Cl. 249—65 14 Claims



1. A disposable inner mould for the construction of a boat hull, said mould comprising;

a hollow, hull shaped form made of flexible non-stretch plastic sheet material tailored into the shape of the inner surface of the boat hull and having two sides, a bottom and bow and stern ends, at least the bow end of which is characterised by the two sides tapering to a point;

means for securing and sealing said form in an inverted position on a base member thereby enclosing between itself and said base a space sealed against the escape of gases therefrom;

means for passing a gaseous medium into said space and inflating said form to extend into its predetermined non-stretch tailored hull shape above said base member as aforesaid, and,

contour support means mounted on said base member and extending upwardly into said form and contacting and supporting the interior of said pointed end of said form whereby to retain it in its tailored predetermined non-stretch shape.

3,985,331

HIGH RESOLUTION MICRO-METERING VALVE

James H. Riley, Fullerton, and Owen T. O'Brien, Torrance, both of Calif., assignors to Circle Seal Corporation, Anaheim, Calif.

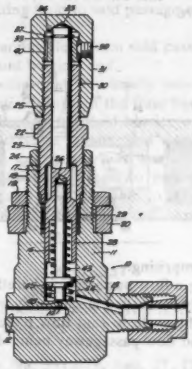
Filed Jan. 6, 1975, Ser. No. 538,787

Int. Cl.² F16K *47/04*

U.S. Cl. 251—77 12 Claims

1. A micro-metering valve comprising: valve body means provided with a fluid flow passage having a flow port opening into a valve chamber, an elongated valve member in said valve

chamber movable toward and away from said port to meter flow therepast, valve adjusting means movably mounted on said valve body with the inner end thereof embracing the adjacent end of said valve member and the outer end projecting from said valve body, first and second coil spring, said first spring having a substantially higher spring rate than said second spring, said coil springs being in axial alignment about opposite end portions of said valve member, said valve member being supported between the adjacent ends of said springs, the remote end of said first spring bearing against the interior of said valve body in an area concentric with said flow port and the remote end of said second spring bearing against the inner end of said valve adjusting means, whereby a discreet movement of said valve adjusting means axially of said valve member effects a much smaller micro-movement of said valve member which movement is a function of the differential spring rates of said first and second coil springs.

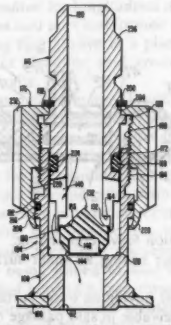


3,985,332

NON-REFILLABLE SAFETY VALVE

Robert Walker, Providence, R.I., assignor to Bristol Screw Products Corporation, Providence, R.I.

Filed Sept. 17, 1975, Ser. No. 613,989
Int. Cl.² F16K *35/00*
U.S. Cl. 251—111 **5 Claims**



1. A non-refillable safety valve for a pressure container, which comprises:

a. a housing, having a central bore, providing communication between a port and said pressure container for charging and selective discharging said pressure container, said central bore having a lower portion that is narrower than the upper portion of said central bore;

b. a hollow knob unit, having a central bore, in threaded engagement with the outer wall of said housing;

c. a core, having a central bore, slidably mounted in said central bore (a) of said housing, the upper end of said hollow knob unit being mounted on said core in a rotatable manner and in fixed longitudinal relationship with said core;

d. a sealing member, which is slidably mounted in the lower end portion of said central bore (c) of said core, said core containing end stop means for preventing movement of said sealing member below the lower end of said core, said sealing member engaging the interface ledge formed by said lower portion and said upper portion of said central bore (a) when said core is moved the maximum possible distance into said central bore (c) or when refill is attempted after discharge of said pressure container, said core containing at least one passageway located in said core outwards from said sealing member for communication between said central bore (c) and said upper portion of said central core (a); and

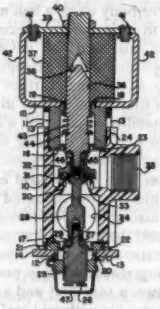
e. an engagable stop means, which is positioned between the outer surface of said housing and the inner surface of said hollow knob unit, for limiting retrograde or outward movement of said core to a position whereby said sealing member still engages said interface ledge when refilling said pressure container, said engagable stop means engaging after said pressure system has been filled and said sealing member, said core and said knob unit have been moved into sealing position.

3,985,333

SOLENOID VALVE

Gary Allen Paulsen, St. Charles, Ill., assignor to Spraying Systems Co., Wheaton, Ill.

Filed Sept. 2, 1975, Ser. No. 609,556
Int. Cl.² F16K *31/06*
U.S. Cl. 251—129 **7 Claims**



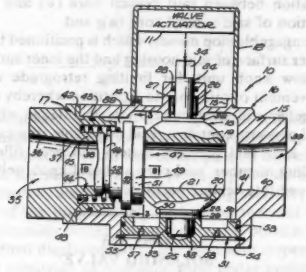
1. A solenoid operated valve including a valve body having inlet and outlet passages communicating with the interior of the valve body upon the opposite sides of a valve seat, a valve enclosed by the valve body operably associated with said valve seat, a valve stem connected with said valve, an armature axially aligned and rigidly connected with said valve stem, an electrically energized coil surrounding said armature and moving said valve relative to said seat, diaphragm seals of equal area sealing the interior of the valve body at the top and bottom sides respectively of said passages, upper and lower diaphragm housings secured to said valve body and clamping said respective diaphragm seals about their perimeters between the housings and the upper and lower ends of said body, said armature reciprocating axially through said upper diaphragm housing and said lower diaphragm piston reciprocat-

ing axially through said lower diaphragm housing, a removable cover enclosing the bottom end of said piston, a bottom plate mounted on said lower diaphragm housing, and said bottom plate, lower housing, valve body and said upper diaphragm housing being secured together by a common connecting means.

3,985,334
BALL VALVE

Frank F. Domyan, Canoga Park, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 491,404, July 24, 1974, Pat. No. 3,961,651, which is a continuation-in-part of Ser. No. 372,203, June 21, 1973, abandoned. This application June 25, 1975, Ser. No. 590,048
Int. Cl.² F16K *25/00*
U.S. Cl. 251—159 **2 Claims**

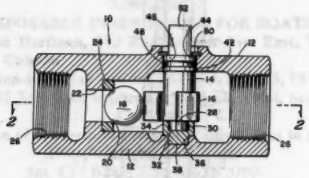


1. Fluid control apparatus comprising: a valve body having first and second ends with first and second openings respectively, extending completely therethrough generally along a first axis, said valve body having internal circumferential wall means substantially defining a chamber intermediate of said first and second valve body ends; a ball mounted on said wall means in a manner to rotate about a second axis substantially normal to said first axis, said ball having spherical surface portions around a cylindrical hole extending completely therethrough defined by an internal surface alignable with said valve body first end first opening, said alignment being made possible by the rotatability of said ball; a seal assembly sealing said valve body first end first opening to said ball, said seal assembly including an annular seal extending around said hole at a diameter greater than that of said hole when said alignment occurs; and bias means mounted between said valve body and said seal assembly to force said seal into fluid tight engagement with said ball, said first and second openings being in communication with each other during said alignment, said ball being rotatable to a position cutting off all communication between said first and second openings; and movable means engageable with said seal assembly to move at least a portion thereof in a direction to eliminate the force produced by said bias means which would otherwise cause said seal to be pressed into fluid tight engagement with said ball to permit easy movement of said ball and seal assembly relative to each other, said seal assembly including a ring approximately concentric with said first axis, said bias means including a spring to bias said ring toward said ball, said movable means including first and second shafts rotatable through and sealed through said wall means on about the same third axis about normal to said first axis and on respective opposite sides of said valve body, means to hold said first and second shafts in at least substantially fixed axial positions along said third axis, each of said first and second shafts having an eccentric thereon inside said chamber engageable and disengageable with said ring to move the same to put the pressure of said seal on and take it off of said ball, respectively, by forcing said ring and said spring in a direction toward and away from said ball, respectively.

3,985,335
BALL VALVE

Donald J. Burke, Tulsa, Okla., assignor to Continental Industries, Inc., Tulsa, Okla.

Continuation of Ser. No. 360,654, May 16, 1973, abandoned. This application June 10, 1975, Ser. No. 585,513
Int. Cl.² F16K *25/00*
U.S. Cl. 251—176 **7 Claims**

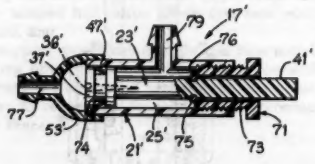


1. A valve comprising:
a body having a flow passageway therethrough;
a shaft sealably journalled in said body with its axis substantially at right angle to said flow passageway, and in the plane of said flow passageway being defined in part by a valve seat;
a ball freely movable in a portion of said passageway against said valve seat to close the valve; and
an actuating arm of flat spring material in a plane at right angle to said shaft, said plane passing through said flow passageway, said arm having two portions extending out from said shaft, a first portion in such position on rotation of said shaft in a first direction to move said ball away from said seat and an S-shaped second portion in such a position on rotation of said shaft in a second direction to move said ball toward said seat, said second portion having at least one substantially 180° bend and a part of said second portion when said ball is on said seat serving to exert a compressive force between said shaft and said ball to press said ball in a radial direction into sealing contact with said seat.

3,985,336
DRIP IRRIGATION VALVE

Clarence Bentley, 9256 Stamps Ave., Downey, Calif. 90240

Filed July 16, 1975, Ser. No. 596,222
Int. Cl.² F16K *1/54, 3/34*
U.S. Cl. 251—205 **16 Claims**



1. A drip irrigation valve comprising:
an outer member having an inner surface defining a passage;
an inner member having an outer surface, said inner member being receivable in said passage of the outer member with said surfaces being generally in confronting relationship;
one of said members having a groove in said surface thereof, said groove having a plurality of regions with each of said regions having a different cross sectional area, said

groove extending in a first direction, at least one component of said first direction extending axially of said one member;

a resilient deformable seal carried by the other of said members and engageable with the surface of said one member in sealing relationship to form a fluid barrier; said seal being deformable into the groove an amount which varies with the fluid pressure on the upstream side of said fluid barrier to make the valve pressure compensating;

means for admitting fluid to said passage on one side of the fluid barrier;

means for discharging fluid from said passage on the other side of said fluid barrier; and

said members being relatively axially movable so that said groove can extend through the fluid barrier and provide a flow path through the fluid barrier whereby fluid can flow to the discharge means, said members being relatively movable to bring at least some of said regions of said groove adjacent the seal to vary the resistance to fluid flow through said flow path to thereby permit control of the flow rate through said flow path.

3,985,337

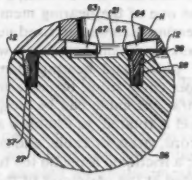
SPOOL VALVE

William B. Gripe, Concord, and Melvin H. Norman, Oakland, both of Calif., assignors to Amot Controls Corporation, Richmond, Calif.

Division of Ser. No. 391,679, Aug. 27, 1973, Pat. No. 3,926,444. This application Sept. 25, 1975, Ser. No. 616,595

Int. Cl.² F16K *3/28*; F16J *9/00*

U.S. Cl. 251—324 **7 Claims**



1. A valve comprising:

a housing having an interior cylindrical wall defining a valve chamber and formed with a passage opening to said wall in a valve port;

a spool valve mounted for longitudinal reciprocation in said chamber across said port and formed with a circumferentially extending ring groove in a plane perpendicular to the axis of said chamber, said groove having root and opposed side walls;

a seal ring of elastomeric material mounted in said groove and having a torus portion of circular cross-section and a diameter less than the spacing between said side walls and extending from said groove into engagement with said chamber wall for longitudinal sliding movement thereover into and out of registration with said port, said ring being formed with an integral concentric annular flexible and compressible web secured to said torus portion and extending radially therefrom into engagement with said root wall and being joined to said torus portion at its center plane and leaving a free torus portion periphery comprising a circular segment greater than 180° providing three perpendicularly related arcuate sealing surfaces juxtaposed to and engageable in line contacts with said groove side walls and said chamber wall; and

the ring diameters of said torus portion and said web providing simultaneous pressure fit against said chamber and root walls respectively.

3,985,338

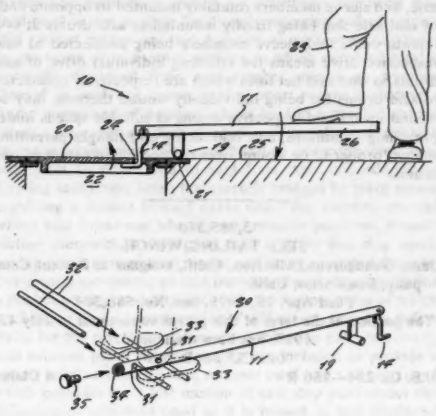
MANHOLE COVER LIFTER

Edgar R. Herrmann, 1431 Cottage St., NE., Salem, Oreg. 97303

Filed Nov. 17, 1975, Ser. No. 632,678

Int. Cl.² B66F *3/00*

U.S. Cl. 254—131 **1 Claim**



1. A manhole cover lifter, comprising in combination, an elongated straight steel pipe, one end of said pipe having a transverse pin therethrough, said pin pivotally supporting a downward extending hook, and a fulcrum being welded to an underside of said steel pipe, said fulcrum being located relatively close to said end of said pipe that supports said hook, said fulcrum comprising a downward extending lug, which at its lower end is welded to a transverse extending steel bar, an opposite end of said steel pipe being provided with a pair of transverse, spaced apart extending openings therethrough, each said openings removably receiving a straight steel rod, said steel rods protruding from opposite ends of said transverse openings, thus forming a grill upon which a person can stand, said steel rods, when removed from said transverse openings, being stored within an interior of said pipe, said opposite end of said steel pipe having a threaded opening receiving a removable end cap, said steel rods being of a diameter that is smaller than the central opening of said pipe, so to slideably be received therewithin, and said steel rods, together, being shorter than the length of said pipe central opening, so as to be fully fitted therewithin.

3,985,339

TRAWL WINCH

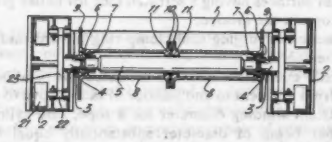
Öyvind Ottar Björshol, Langoyneset, Norway, assignor to P. Bjorshol Mek. Verksted, Langoyneset, Norway

Filed July 18, 1974, Ser. No. 489,765

Claims priority, application Norway, July 18, 1973, 2923/73

Int. Cl.² A01K *73/06*

U.S. Cl. 254—137 **1 Claim**



1. A trawl winch for hauling in and paying out a pair of net lines and the net proper, comprising in combination a pair of

coaxially mounted separate drums, and independently adjustable individual positive drive means associated with each of the said drums for positively increasing and decreasing the rotational speed of said drums relative to each other, each drum being provided with end flanges of which those situated at the drum ends facing each other are of a diameter which is less than the diameter of the end flanges situated remote from each other, each of said drums being mounted on a common axle, and sleeve members rotatably mounted to opposite ends of said axle and being fixedly mounted to said drums at said remote ends, said sleeve members being connected to said respective drive means for effecting individual drive of said drums so that said net lines which are respectively connected to said drums for being individually wound thereon, may be wound up on said respective drums at suitable speeds under prevailing conditions, and said facing end flanges permitting the net proper to be wound over the combined extent of said drums.

3,985,340

SELF TAILING WINCH

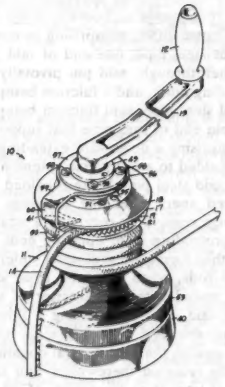
Jesus Guangorena, Atherton, Calif., assignor to Barient Company, San Carlos, Calif.

Filed Apr. 15, 1975, Ser. No. 568,304

The portion of the term of this patent subsequent to July 13, 1993, has been disclaimed.

Int. Cl.[2] B66D *1/30*

U.S. Cl. 254—150 R **4 Claims**



1. A self-tailing winch for a rope, including in combination:

a stationary frame,

a rotary input shaft rotatably supported by said frame,

a rotary drum rotatably supported by said frame,

a gear train connecting said rotary input shaft to said rotary drum so that said drum is driven by said shaft,

an axially movable clamp ring attached to and spaced from one end of said drum for rotation therewith, said ring and said drum end each having inner annular surfaces defining an annular groove between them, at least one of said annular surfaces having a serrated face for better gripping of a rope in the groove,

spring means for urging said clamp ring toward said drum end yieldably,

a generally cylindrical member mounted for rotation with said drum adjacent to and interior of said groove to define a constant winding diameter for a rope, said cylindrical member being of diameter substantially equal to the winding diameter of the drum,

a stationary member anchored to said frame on top of said clamp ring,

rope deflector means supported by said stationary member for assisting in feeding a rope from said drum to said groove, and

rope stripping means supported by said plate for assisting in paying out the rope from said groove.

3,985,341

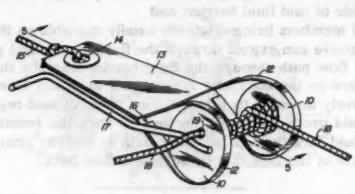
WINCH-TYPE TENSIONING DEVICE

Ivar J. Akre, 1436 E. 3150 South, Salt Lake City, Utah 84106

Filed May 23, 1975, Ser. No. 580,340

Int. Cl.[2] A63B *61/04*

U.S. Cl. 254—161 **7 Claims**



1. A winch-type device for establishing and maintaining tension in a tie rope, cord, strap, or cable, said device comprising a reel formed by two end discs which are jointed together by an elongate shaft extending from the center of one disc to the center of the other disc; a support for said reel comprising a pair of bearing members, the bearing faces of which, respectively, encompass and make sliding contact with a sufficient portion of the perimeters of said end discs so that said end discs are retained by said bearing members for sliding rotational movement of said discs therewithin; a connecting member extending from one of the bearing members to the other and holding the bearing members in fixed position about said disc members; cranking means associated with said discs for rotating said reel within said bearing members; means for attaching a tie rope, cord, strap, or cable to the reel so that said rope, cord, strap, or cable can be wrapped around said shaft when said reel is rotated, to establish and maintain tension in the rope, cord, strap, or cable, and self-locking means adapted to provide a frictional force on the reel, said frictional force being produced at the perimeter of the end discs of the reel as a result of the forced contact of said discs with the bearing faces of said bearing members, said discs having a radius which is at least about 2.5 times the sum of the radius of said elongate shaft and the diameter of said tie rope, cord, strap, or cable, so that the frictional force exerted on the reels produces a torque in said reel which is at least equivalent to the torque on said reel resulting from the tension in the tie rope, cord, strap, or cable.

3,985,342

PORTABLE HOIST

Stephen A. Denman, 1216 Cloverfield Ave., Dayton, Ohio 45429

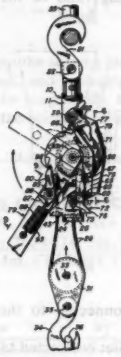
Continuation of Ser. No. 178,076, Sept. 7, 1971, abandoned, which is a continuation of Ser. No. 854,577, Sept. 2, 1969, abandoned. This application June 23, 1975, Ser. No. 589,578

Int. Cl.[2] A63B *61/04*

U.S. Cl. 254—164 **29 Claims**

1. A unit usable as a hoist, puller or the like comprising a cable drum, support means mounting said cable drum for relative rotary motion, a ratchet device in connection with said drum, a feed pawl and a retainer pawl having an operative relation to said ratchet device, an actuating lever carrying said feed pawl which is reciprocably movable thereby in successively opposite directions, means for setting said feed pawl to a first position wherein it utilizes a stroke of said lever in one direction to advance the drum through the medium of said ratchet device while the retainer pawl normally prevents ret-

rograde motion thereof during the stroke in an opposite direction, said feed pawl being settable to a second position in which it is lifted from engagement with said ratchet device during a stroke in said one direction, means disposed toward the end of the stroke in said one direction to deflect said feed pawl from a said lifted position into engagement with the ratchet device, the feed pawl when so deflected controlling retrograde motion of the drum during the stroke of the lever in said opposite direction, said deflecting means being arranged to apply pressure to disengage said retainer pawl from said ratchet device on engagement thereof by said feed pawl, latch means adapted, in one position thereof, to hold the disengaged retainer pawl from reengagement, and means for disabling said latch means and releasing said retainer pawl in response to movement of said lever to a predetermined position in its stroke in said opposite direction.



11. A unit usable as a hoist, puller or the like comprising a cable drum, support means mounting said cable drum for rotation thereon, a ratchet means in connection with said drum, a retainer pawl for said ratchet means normally biased to hold said ratchet means and said drum thereby, said retainer pawl being adapted for displacement from said ratchet means to permit the advance of said drum, an actuating lever mounting a feed pawl for pivotal movement thereon, said actuating lever being pivotally connected to said support means and embodying means for selectively orienting said feed pawl in one position for directly engaging said advancing said ratchet means and said drum on movement of said lever in one sense or in another position in which said pawl is normally displaced from said ratchet means on advance thereof in said one sense, said actuating lever including means defining an opening therein and said means for selectively orienting said feed pawl in said one position or another including a tensioning unit disposed in said opening one end portion of which tensioning unit is anchored to said lever within said opening and an opposite end portion of which is engaged to said feed pawl within said opening, said feed pawl having, in connection therewith, means defining a guide surface on which the engaged end of said tensioning unit bears in tension, said guide surface being smoothly continuous, arcuate in form and free of offsets or depressions and having terminal ends, and the opening in said actuating lever in which said tensioning unit is located being configured to provide that a finger of a user may be applied directly to said tensioning unit to cause the same to move in lever-like fashion to have the end thereof engaged to said guide surface bearingly move to one or the other end thereof, through the medium of which said tensioning unit will then apply tension to fix said feed pawl in either said one position in which it may engage with said ratchet means or another position in which it is displaced therefrom.

23. A unit usable as a hoist, puller or the like comprising a cable drum, support means mounting said cable drum for rotation thereon, a ratchet means in connection with said drum, a retainer pawl for said ratchet means normally biased to hold said ratchet means and said drum thereby, said retainer pawl being adapted for displacement from said ratchet means to permit an advance of said drum, an actuating lever mounting a feed pawl for pivotal adjustment thereon, said actuating lever being pivotally connected to said support means and embodying means for selectively orienting said feed pawl in one position for directly engaging and advancing said ratchet means and said drum on movement of said lever in one sense or in another position in which said feed pawl is normally displaced from said ratchet means on advance thereof in said one sense, said support means including a frame comprised of opposed plates held in a parallel spaced relation intermediate their respective ends, adjacent of which ends are turned over, overlapped and so interconnected as to form flats to either end of said fram, said opposed plates forming said frame being transversely bridged by pivot means providing a mount of said cable drum for rotation on and within said frame and wherein said retainer pawl has, in association therewith, a stop pawl, said retainer and stop pawls having a common pivotal mount and being mounted for relative pivotal movement on said frame, and said stop pawl forms a pocket nesting said retainer pawl, the remote sides of which pocket dispose to opposite sides of said retainer pawl to define limits for the pivoting movement of said stop pawl relative to said retainer pawl, wherein means are included to provide a biased relation between said retainer pawl and said stop pawl which provides for a lost motion of said stop pawl under the influence of said feed pawl as it is moved in said displaced position thereof to effect a displacement of said retainer pawl from said drum, and additional pivot means disposed in bridging relation to the opposed plates forming said frame pivotally mounting said retainer and stop pawls, and a biasing spring mounted on said additional pivot means one end of which is anchored with respect to said frame and the other of which provides said normal bias to position said retainer pawl to hold said ratchet means.

3,985,343

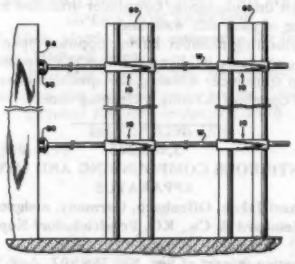
METHOD FOR FENCE CONSTRUCTION

John J. Sasena, Parma, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 536,146, Dec. 24, 1974. This application May 27, 1975, Ser. No. 580,637

Int. Cl.[2] B21F *27/00*

U.S. Cl. 256—47 **3 Claims**



1. A fence construction system comprising:

at least one strand of fencing wire, said strand of fencing wire being of a predetermined maximum diameter and of a length sufficient to extend the length of the fence;

a plurality of cross-sectionally channel shaped fence posts, each of said posts comprising a pair of generally parallel side walls, a rear wall extending perpendicularly between said side walls and a pair of inturned flanges extending from the front edges of said side walls;

means to rigidly fixed the ends of the strand to a fixed end support; and

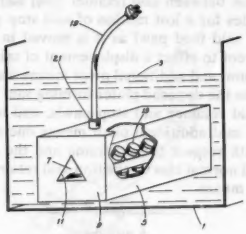
a plurality of fasteners for mounting the strand of wire generally perpendicularly to the axis of the posts to be interposed the rigidly fixed ends of the strand, said fasteners mounting the strand for movement along the axis of the strand relative to the post, said fasteners comprising a one-piece, generally cross-sectionally U-shaped body having a pair of substantially flat, generally parallel, generally T-shaped members joined along substantially the entire top portions thereof by a bight portion extending generally perpendicularly therebetween, said T-shaped members comprising a top portion and a base portion, said top portions in combination with the bight portion forming a trough for receipt of the strand and said base portions being of dart shape for forceful receipt inbetween and permanent retention by the inturned flanges of said posts.

3,985,344

ULTRASONIC CLEANING APPARATUS

James W. McCord, 9829 Timberwood Circle, Louisville, Ky. 40214

Filed June 2, 1975, Ser. No. 582,614
Int. Cl.² B08B 3/12
U.S. Cl. 259—1 R **7 Claims**



1. An ultrasonic cleaning apparatus comprising:

a. a tank open at the top;

b. an ultrasonic transducer housing having a pair of opposed openings therein mounted in said tank;

c. a vibrating member disposed within the housing, the vibrating member having at least three side walls;

d. at least one ultrasonic transducer attached to the outer surface of each side wall; and,

e. said vibrating member having opposed open ends, said open ends being in alignment with the opposed openings in said transducer housing, the spacing between the opposed openings defining a cleaning zone.

3,985,345

CONTINUOUS COMPOUNDING AND MIXING APPARATUS

Peter Michael Jakob, Offenbach, Germany, assignor to Colortronic Reinhard & Co., KG, Friedrichsdorf-Koppern, Germany

Continuation-in-part of Ser. No. 386,902, Aug. 9, 1973, abandoned. This application Oct. 17, 1974, Ser. No. 515,756
Claims priority, application Japan, Aug. 15, 1972, 47-81760
Int. Cl.² B01F 7/20, 15/02, 15/04
U.S. Cl. 259—8 **5 Claims**

1. A compounding and blending apparatus comprising:

1. a mixing vessel for blending main and subsidiary raw materials;

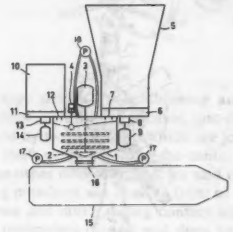
2. a hopper for the main raw material attached to said mixing vessel, said hopper being equipped with a volume type metering device which has a metering and feeding opening connected to an upper raw material feed opening of the mixing vessel and which is actuated by an electric motor;

3. at least one hopper for a subsidiary raw material, said hopper being equipped with a volume type metering device which has a metering and feeding opening connected to the upper raw material feed opening of the mixing vessel and which is actuated by an electric motor;

4. a level switch for emitting "on" signals when the level of the mixture in said mixing vessel reaches a predetermined reduced level;

5. pulse generators arranged with the respective volume type metering devices to be actuated by said metering devices to emit pulse signals every time the corresponding metering devices meter predetermined unit volumes of the raw materials;

6. manually presettable counters for metering the main raw material and subsidiary raw material based on unit dose volumes of the raw materials corresponding to a predetermined compounding ratio of the raw materials, said



counters being connected to the corresponding pulse generators; and

7. a program controller connected to each of said counters, said level switch and each of the electric motors for the metering devices of said hoppers, said program controller being so arranged and constructed that, when it receives "on" signals from said level switch, it emits operation signals for rotating each of said electric motors and that, when the numbers of pulses transmitted by the respective pulse generators reach the pre-set count numbers of said counters, said program controller emits signals for temporarily stopping the electric motors,

whereby a unit program cycle for attaining the desired compounding ratio of the main and subsidiary raw materials is performed when the count number of each of said counters reaches the predetermined value and supply of the main and subsidiary raw materials compensating for the reduced amount of the mixture may be continuously conducted by repeating the unit program cycle by automatic re-setting of said counters.

3,985,346

METHOD FOR MIXING SHAKEN DRINKS

William James Merz, 220 W. Rittenhouse Square, Philadelphia, Pa. 19103

Filed Nov. 27, 1974, Ser. No. 527,630
Int. Cl.² A47J 43/27
U.S. Cl. 259—72 **3 Claims**

1. The method of preparing potable drinks of the type produced by shaking measured quantities of at least two different constituents with ice particles, and then serving the shaken drink in a serving glass containing ice particles, which method comprises positioning a plurality of shaker shells in a horizontal support from which they depend with their open ends downward, and from which they are selectively and alternatively removable, each of said shaker shells being conspicuously marked with indicia designating one only of various kinds of drinks; placing in a shaker shell the indicated quantity of each of the ingredients desired to produce a blended drink

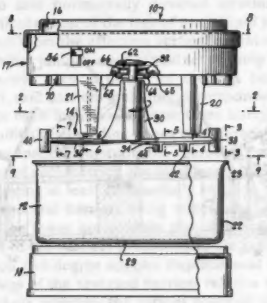
of the type designated, bringing the open end of the shaker shell into registering engagement with the open end of a serving glass of the desired type, holding the serving glass and shaker shell as a unit while shaking them to effect complete mixing of the desired drink, turning the shaken drink, including its ice content, into the serving glass, removing the shaker shell, serving the drink, and replacing the shaker shell in the support mentioned, in preparation for use solely in mixing additional drinks of the species designated by the indicia on that shell.

3,985,347

ICE CREAM MACHINE

John S. Doyel, 404 W. 20th St., New York, N.Y. 10011

Filed July 26, 1974, Ser. No. 492,178
Int. Cl.² B01F 7/18
U.S. Cl. 259—108 **11 Claims**



1. An ice cream machine comprising:

an open top receptacle having a substantially horizontal bottom and an upwardly extending sidewall and suitable for containing ingredients for making ice cream; and

a housing releasably mounted at a fixed position with respect to the receptacle and disposed over the receptacle and comprising:

a dasher having a shaft extending downwardly into the receptacle to a level above the bottom thereof and rotatably mounted in the housing to rotate about a substantially vertical axis, said dasher further having a elongated substantially horizontally extending blade affixed to the bottom end only of the shaft and being spaced from and out of contact with the bottom and sidewall of the receptacle, said blade being adapted to stir said ingredients when rotating about said axis, said shaft being centered with respect to the receptacle;

at least one substantially vertical post fixedly mounted to the housing eccentrically of the shaft and extending downwardly into the receptacle only to a level above the the blade; and

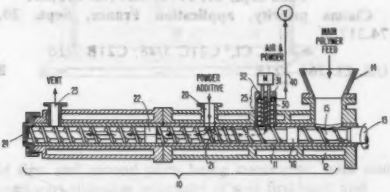
a power unit mounted within the housing and means mounted within the housing for transmitting power from the power unit to the dasher shaft to cause rotation of the dasher about said axis, said dasher thereby rotating with respect to the receptacle and the post to stir the ice cream ingredients wherein said dasher blade has a major surface extending along a plane slightly inclined with respect to the bottom of the receptacle.

3,985,348

APPARATUS AND METHOD FOR FEEDING A POWDERY MATERIAL TO A PLASTICIZED, PRESSURIZED POLYMER

Richard H. Skidmore, Strafford, Pa., assignor to W Bar E, Incorporated, Marianna, Fla.

Filed Jan. 14, 1975, Ser. No. 540,953
Int. Cl.² A21C 1/06; B29B 1/10; B29H 1/10
U.S. Cl. 259—191 **10 Claims**



1. In an apparatus for feeding, to a plasticized polymer mass, a powdery material which contains entrapped air, the combination which comprises:

a. an extruder having an entrance for feeding said polymer, and having an elongated worm arranged for rotation in a housing and having worm flights arranged to transport said polymer from said entrance to a polymer exit formed in said housing,

b. means forming an entrance port for said powdery material together with its entrapped air, downstream of said polymer entrance, and

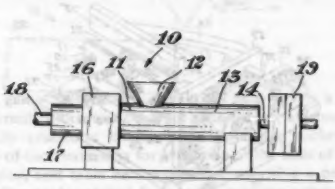
c. vent means in said housing upstream of said means (b) but downstream of said polymer entrance and sealed therefrom.

3,985,349

INJECTION MOLDING MACHINE AND METHOD OF OPERATION THEREOF

Robert H. Ritzie, Mystic, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 6, 1975, Ser. No. 556,057
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² B29B 1/06
U.S. Cl. 259—191 **5 Claims**



1. In a reciprocating screw injection molding machine, the molding machine comprising a barrel having a rotating forwarding extruder screw therein the screw having at least one forwarding flight, means to reciprocately position the screw

within the barrel and means to heat plastify synthetic resinous thermoplastic materials within the barrel, the improvement which comprises the screw having a feed zone adjacent the feed end, a first compression zone adjacent the feed zone and disposed toward a discharge end of the screw, a decompression zone disposed adjacent the first compression zone and remote from the feed zone, a second compression zone disposed at the discharge end of the screw and adjacent the decompression zone, at least one passage defined within the screw providing a path between the decompression zone and the discharge end of the screw, a valving means to selectively open or close the passage within the screw.

3,985,350

CONVERTER

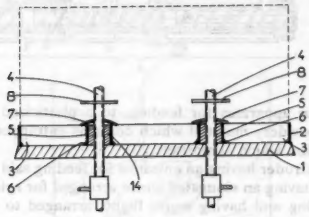
Pierre Leroy, Saint-Germain-en-Laye, and Emile Sprunck, Moyeuvre-Grande, both of France, assignors to Emile Sprunck, Moyeuvre-Grande and Creusot-Loire, Paris, both of France

Filed Sept. 19, 1975, Ser. No. 615,081

Claims priority, application France, Sept. 20, 1974, 74.31758

Int. Cl.² C21C 5/48; C21B 7/16

U.S. Cl. 266—218 **8 Claims**



1. A device for retention of hydrocarbons in the bottom of a steelworks converter including blast-pipes protected by a flow of hydrocarbons, said device comprising a retainer cup comprising a disc of the same dimensions as the bottom plate of the converter and laid on the bottom plate and a strip bent into a cylinder of the same dimensions as the bottom plate, engaged with the periphery of said disc and extending upwardly from said disc, and an annular member in respect of each blast pipe, welded to and surrounding the respective blast pipe above said disc and engaged in a fluid tight manner with the upper surface of said disc.

3,985,351

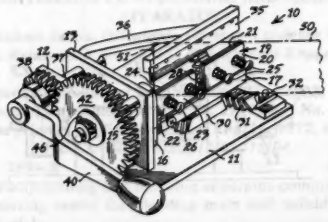
WEB FOLDING APPARATUS

Justice A. Fortenbery, Rte. 2, Benton, Ky. 42025

Filed Jan. 8, 1976, Ser. No. 647,656

Int. Cl.² B65H 45/12

U.S. Cl. 270—62 **10 Claims**



1. An apparatus for folding a piece of sheet material comprising:

a. a first pair of jaw elements, having opposite ends, forming a first elongated slot therebetween having a depthwise dimension and adapted to receive a creased piece of sheet material,

b. a second pair of jaw elements, having opposite ends, forming a second elongated slot therebetween having a depthwise dimension, and adapted to receive a creased piece of sheet material, one pair of ends of said second pair of jaw elements being adjacent one pair of ends of said first pair of jaw elements,

c. hinge means pivotally joining said adjacent ends of said first and second pairs of jaw elements, said hinge means having a pivotal axis parallel with the depthwise dimensions of said first and second slots,

d. said hinge means permitting said first and second pairs of jaw elements to swing through an approximately 180° angle between a creasing position in which said slots are aligned end-to-end and a folding position in which said second pair of jaw elements substantially overlies said first pair of jaw elements, and said first and second slots are substantially parallel to form a fold in a piece of sheet material held between said first and second pairs of jaw elements, and

e. a creasing element for forcing a straight portion of a piece of sheet material into said aligned first and second slots in said creasing position to form an elongated crease in said piece.

3,985,352

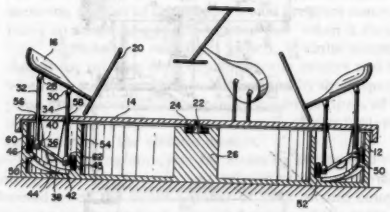
RIDER PROPELLED ROTATABLE RIDING DEVICE

Merlin J. Nitzsche, P.O. Box 96, Beemer, Nebr. 68716

Filed Oct. 15, 1975, Ser. No. 622,719

Int. Cl² A63G 1/20, 1/34

U.S. Cl. 272—33 R **12 Claims**



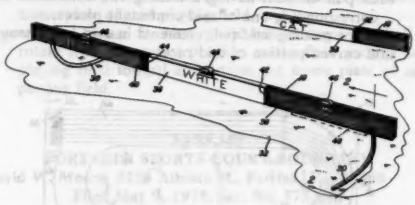
1. A rider propelled rotatable riding device comprising two similar, concentrically mounted, circular, vertically undulating tracks formed with peaks and valleys, the tracks being of different radii such that they are spaced from each other as inner and outer tracks, a rotatable rider supporting structure mounted for rotation concentrically with respect to said tracks, a pair of freely rotatable wheels coupled to said rider supporting structure and generally vertically movable for rolling along the undulating surfaces of respective ones of said tracks, the tracks and wheels being relatively disposed such that each wheel relative to its undulating track is out of phase with the other wheel relative to its undulating track, and rider controlled linkage means for selectively intermittently urging either wheel against its undulating track surface with increased force relative to the other wheel, whereby said supporting structure can be rotatably driven by selectively and alternately urging either wheel against a downhill portion of its undulating track relative to the force urging the other wheel against a non-downhill portion of the other undulating track.

3,985,353

PHYSICAL AND MENTAL DEVELOPMENT JUMP SET

Donald T. Vosberg, 3625 E. Flower, Apartment E, Tucson, Ariz. 85716

Filed July 1, 1975, Ser. No. 592,325
Int. Cl.² A63B 5/02
U.S. Cl. 272—102 3 Claims



1. A physical and mental development jump set for children, said set comprising a plurality of horizontal elongated jump barriers disposed in generally parallel laterally spaced and aligned position, the opposite end portions of said jump barriers including depending support legs whose lower ends are equipped with foot portions adapted for support from a horizontal support surface, the opposite end portions of said jump barriers including means defining downwardly opening sockets, the upper ends of said legs being telescopingly and rotatably received in said sockets for angular displacement relative to the corresponding barriers about axes generally coinciding with the longitudinal center lines of said upper end portions, said foot portion comprising lower end longitudinally directed integral terminal ends of said legs, the lower end portions of said legs comprising curved sections smoothly merging into said horizontally directed terminal ends, the effective vertical extent of the legs of one of said jump barriers being different from the effective vertical extent of the legs of at least one other jump barrier of said set of jump barriers, the greatest effective vertical extent of the legs being approximately 1 foot, said barriers including corresponding longitudinal side faces each including at least three horizontally elongated longitudinally extending zones of different light reflecting properties spaced longitudinally therealong and on opposite side faces of each barrier, the total length of said zones on each barrier being at least substantially equal to the length of that barrier and said barriers being selectively reversible end to end, with the lower horizontally directed terminal ends of the legs of all of the barriers projecting in the same horizontal direction upon 180 degree angular displacement of the upper ends of the legs of the reversed barriers relative to the corresponding sockets, whereby the various zones of different light reflecting properties of said barriers may be alternately varied in position along said barriers for the purpose of requiring a jumper to jump over alternately positioned predetermined longitudinal zones of similar light reflecting properties of successful barriers.

3,985,354

EXERCISE DEVICE WITH SPRING BIASED TELESCOPING MEMBERS

William Schulkin, 186 Riverside Drive - Apt. 5-A, New York, N.Y. 10024

Filed May 21, 1975, Ser. No. 579,570
Int. Cl.² A63B 21/00
U.S. Cl. 272—134 6 Claims

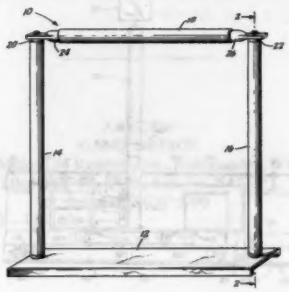
1. A four sided portable exercise device comprising

a. a pair of elongated, parallel spaced aprat elements movable relative to each other;

b. a pair of elongated, parallel spaced apart telescoping connecting members;

c. one of said connecting members connecting one end of each of said elements, and the other of said connecting members connecting the other end of each of said elements;

d. each connecting member comprising a first outer part connected to one of said spaced apart elongated elements and a second inner part connected to the other of said spaced apart elongated elements;



e. said first and second parts being concentric, with said second part slideable internally of said first part; and

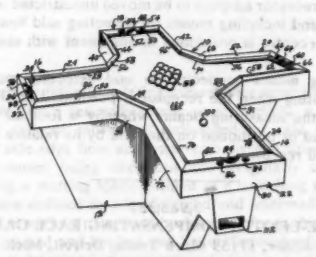
f. resilient means in said first part, said resilient means interconnecting said first and second parts of each of said connecting members to bias said second part toward said first part during the movement of one of said elongated elements, during an exercise program.

3,985,355

GAME

Donald Shoemaker, 2933 48th Court, Cicero, Ill. 60650

Filed Apr. 21, 1975, Ser. No. 570,238
Int. Cl.² A63D 15/00
U.S. Cl. 273—3 A 7 Claims



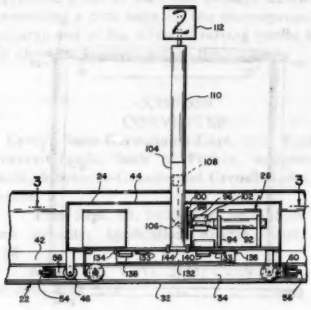
6. A game comprising a plurality of balls having a plurality of different colors, one color for each player, a game table of generally cruciform configuration having a pocket in the middle of each extremity for reception of the balls of a particular color, said table having a base comprising a pair of leg assemblies each notched for reception of the other, each of said leg assemblies being provided with an inclined trough for feeding balls received in one of the pockets of each assembly down to a readily accessible receptacle, the game object being to place all of the balls of a particular color in the pocket identified with the same color.

3,985,356

APPARATUS FOR LOCATING AND POSITIONING A FOOTBALL ON A FOOTBALL PLAYING FIELD

Charles R. Carlock, 5611 Sir Gareth, San Antonio, Tex. 78218

Filed July 25, 1974, Ser. No. 491,769
Int. Cl.[2] A63B 67/00
U.S. Cl. 273—55 R 10 Claims



1. An apparatus for locating the position of a football on a football playing field comprising,
a track positioned parallel to one side of and spaced from the playing field,
a carriage having a plurality of wheels engaging said track and supporting said carriage,
beam directing means for producing a measuring beam loosely carried by said carriage for directing said beam across said field and perpendicular to said track,
said track including a stationary alignment bar, said stationary alignment bar being positioned near said track and parallel thereto;
a traveling alignment bar perpendicularly connected to said beam directing means and movably carried by said carriage along said stationary alignment bar,
means mounted on said traveling alignment bar and engaging said stationary alignment bar for maintaining said traveling alignment bar in parallel alignment with said stationary bar,
a beam receptor adapted to be moved unrestricted over said field and including means for detecting said beam when said receptor is positioned in alignment with said beam, and
signaling means connected to said detecting means for indicating when the receptor is positioned in alignment with the measuring beams whereby a football may be located or positioned on the field by its relative position to said receptor.

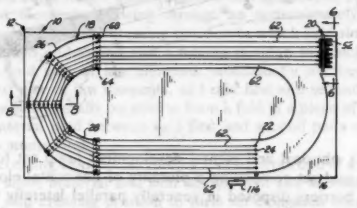
3,985,357

LANE-LENGTH-COMPENSATING RACE GAME

Robert D. Miller, 17159 Mark Twain, Detroit, Mich. 48235

Filed July 14, 1975, Ser. No. 595,539
Int. Cl.[2] A63F 9/14
U.S. Cl. 273—86 G 9 Claims

1. A lane-length-compensating race game comprising
a race game supporting structure having an approximately J-shaped race course with multiple parallel lanes thereon and with starting and finish positions thereon disposed remote from one another and with a curved portion therebetween,
a multiplicity of contestant pieces adapted to be moved along said lanes between said starting and finish positions,
means at said starting position for holding said contestant pieces laterally apart from one another and within said lanes,
a multiplicity of winding spools rotatably mounted side-by-side on said structure at a location beyond said finish position in spaced relationship therewith,
a multiplicity of elongated flexible pull elements disposed in a substantially common plane along said lanes,
each pull element having a leading end connected to one of said winding spools for winding thereon in response to rotation thereof,
each pull element having a trailing end connected to a corresponding one of said contestant pieces,
means for guiding said pull elements in said lanes around said curved portion of said race course,



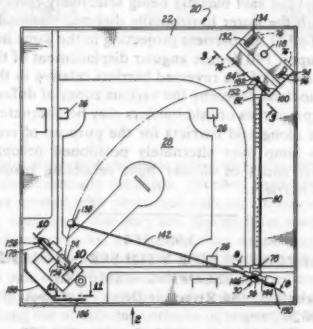
a lane-length-compensator pivotally mounted on said structure between said finish position and said winding spools for swinging in the plane of said pull elements toward and away from said finish position,
said compensator having pull element guides thereon disposed in radially-spaced locations therealong,
said pull elements passing through said guides,
and driving mechanism for simultaneously rotating said winding spools and swinging said compensator relatively to said finish position.

3,985,358

SIMULATED BASEBALL GAME

Nobuo Hamano, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Sept. 15, 1975, Ser. No. 613,241
Claims priority, application Japan, Sept. 17, 1974, 49-112579[U]
Int. Cl.[2] A63F 7/06
U.S. Cl. 273—89 15 Claims



1. A simulated baseball game having a simulated baseball playing field, a simulated baseball, tether means for controlling the movement of said ball connected to said ball, support means for holding said tether means relative to said playing field connected to said tether means, and simulated bat means for hitting said ball in which the improvement comprises:
said support means including a pylon extending above said playing field,

said tether means comprising an elongated arm, said ball being connected to one end of said arm,

universal joint means connecting said arm and said pylon for permitting said arm to rotate across said playing field at various levels with respect to said playing field,

said pylon and said arm being positioned and dimensioned so that said ball is held in such a manner that it can be rotated between the field area of said playing field and the home plate of said playing field, and

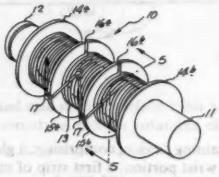
propulsion means for hitting said ball to cause said ball to rotate from an at rest position in the field area of said playing field toward and across the home plate of said playing field.

3,985,359

PORTABLE SPORTS COURT BOUNDARY

David W. Moore, 3228 Atlanta St., Fairfax, Va. 22030

Filed May 9, 1975, Ser. No. 575,993
Int. Cl.² A63B 71/02
U.S. Cl. 273—95 H 7 Claims



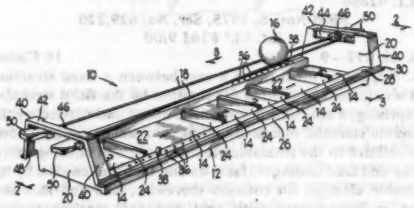
1. A boundary for a sport such as badminton played on land within an enclosed defined area, comprising a continuous enclosed outer boundary of a shape conforming to said enclosed defined area and a plurality of line segments connected to said outer boundary interiorly thereof and forming sub-boundaries within said outer boundary, said line segments being formed of a flexible material and said unitary boundary as a whole being capable of integral placement in a desired location for playing said sport and integral removal from said location, and anchor means for securing said boundary in said desired location, and wherein said boundary is of sufficient flexibility to permit it to be wound on a spool, and spool means on which said boundary is wound.

3,985,360

GAME APPARATUS

Burton C. Meyer, Downers Grove, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Sept. 15, 1975, Ser. No. 613,255
Int. Cl.² A63F 7/00
U.S. Cl. 273—109 10 Claims



1. A game device, comprising:

a base including score indicating means;

a pair of rods movably supported on said base above the score indicating means, both ends of each of said rods being movable laterally with respect to each other and said base; and

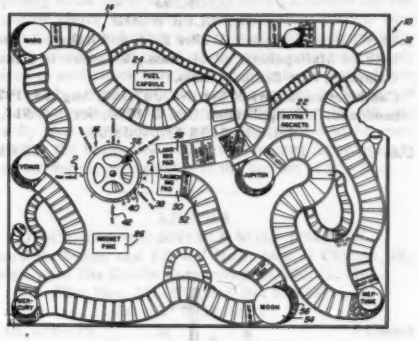
a movable playing object adapted to be supported by said rods or by said base, whereby said playing object can be moved in a direction longitudinally along said rods or be dropped onto said base in score indicating relationship to said score indicating means as a player of the game at each adjacent end of said rods attempts to control the movement of the rods and thus the movement of said object and to determine when it will drop onto said base to score.

3,985,361

GAME DEVICE

Richard A. Millen, 34 Randall Ave., Rhinelander, Wis. 54501

Filed Jan. 15, 1975, Ser. No. 541,097
Int. Cl.² A63F 3/00
U.S. Cl. 273—134 AA 1 Claim



1. A space travel simulating game device comprising a game board having a generally planar upper surface, a single segmental path of movement delineated on said surface by spaced side edge lines and transverse division lines, said path of movement being circuitous and irregularly curved and including a starting space defined as a launching pad and an end space defined as a landing pad and intermediate spaces defined as various planets and orbit areas for each planet, said launching pad and landing pad being disposed adjacent each other, said path of movement including numerical indicia associated with the spaces in each orbit area for controlling movement of the game pieces onto the planets, a plurality of game pieces of rocket shaped configuration movable along the path of movement, said path of movement including an intersecting portion adjacent the landing pad defined by two triangular areas provided with indicia to instruct game pieces landing thereon to proceed to the landing pad or proceed along a substantial portion of the path of movement, a plurality of stacks of instructional cards positioned on the game board, a spinner rotatably mounted on the game board adjacent the launching pad and landing pad, said spinner including a pointer associated with numerical indicia on the game board, for indicating the number of spaces to be moved by the game pieces of each player during his turn, said spinner being

a circular disk having circumferentially spaced finger receiving openings therein, means rotatably mounting the circular disk on the game board, said game board having instructional indicia associated with the spinner for controlling the movement of the game pieces in combination with instructional indicia on certain areas of the path of movement and instructional indicia on the cards, said path of movement including bypass paths by which game pieces may bypass certain planets or take a longer route to the landing pad, one bypass path leading into a dead end space.

3,985,362

Patent Not Issued For This Number

3,985,363

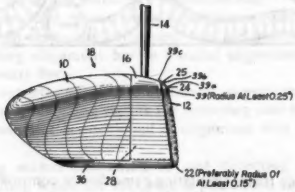
GOLF CLUB WOOD

John W. Jepson, Marion; Walter Reid, and Robert A. Brown, both of Mattapoisett, all of Mass., assignors to Acushnet Company, New Bedford, Mass.

Continuation-in-part of Ser. No. 387,760, Aug. 13, 1973, abandoned. This application Oct. 2, 1974, Ser. No. 511,128

Int. Cl.[2] A63B *53/04*, *53/02*

U.S. Cl. 273—173 **35 Claims**



34. A "wood type" golf club having a club head and a shaft comprising:

a. a club head block of wood;

b. a reinforcing collar having front and back faces, the back face being affixed to said club head block, said reinforcing collar being substantially the same in peripheral dimension as the peripheral dimension of the club head block immediately adjacent the reinforcing collar;

c. a face plate which is a separate piece from the reinforcing collar but which is integrally affixed to the front face of said reinforcing collar;

d. a shaft affixed to said reinforcing collar;

e. the reinforcing collar having a hole in the central portion thereof of at least one-half of a square inch in cross sectional area therethrough from front to back; and

f. said face plate being in intimate contact with the said club head block substantially throughout the area of the hole in the reinforcing collar.

3,985,364

GOLF TRAINING DEVICE

Joseph P. Brady, 10 Hillcrest Lane, Gallipolis, Ohio 45631

Filed May 12, 1975, Ser. No. 576,549

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—183 B **10 Claims**

1. A golf training device, comprising: a glove having fingers, a back and a wrist portion; a first strip of material attached to the back of said glove; a length of non-stretchable cord; and a second strip of material separably attachable to said first strip of material secured to one end of said cord, said second strip of material being attachable in confronting relation to said first strip of material, the structural characteristics of said separably attachable first and second strips corresponding to those of the interlocking fabric material VELCRO so that said strips will adhere to each other when pressed together, and said strips will produce a tearing sound as an audible signal to the golfer when a predetermined force is applied to said cord and causes said strips to separate while said golfer is training.

3,985,365

REMOTELY ACTUATED EMERGENCY SHAFT SEAL

Bartholomew Thomas Catanzaro, 288 Potters Ave., Warwick, R.I. 02886

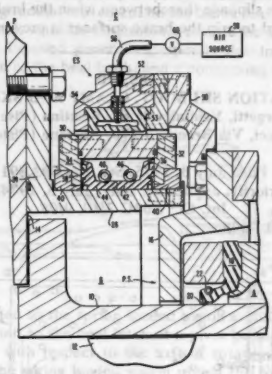
Filed Nov. 6, 1975, Ser. No. 629,220

Int. Cl.[2] F16J *9/00*

U.S. Cl. 277—9 **19 Claims**

1. Apparatus for forming a seal between a fixed structure and an element supported for rotation by the fixed structure comprising; a seal housing disposed about and carried by the rotatable element, means mounting said seal housing for rotation relative to the rotatable element, said seal housing carrying an end face sealing surface, an end face seal carried by the rotatable element for rotation therewith, said end face seal lying in engagement with said end face sealing surface whereby said housing and said end face seal normally rotate with the rotatable element, an inflatable bladder carried by the fixed structure about the rotatable element and spaced from said seal housing, and means for inflating said bladder to engage said bladder against said seal housing and prevent rotation thereof with said end face seal and the rotatable

element, whereby said bladder and said housing form a static seal between the rotatable element and fixed structure and



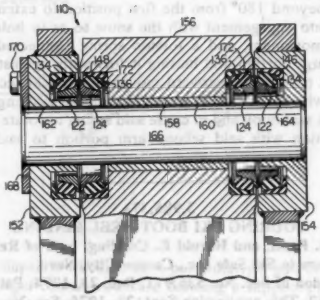
said end face seal and said sealing surface form a dynamic seal between the fixed structure and the rotatable element.

3,985,366

DUO-CONE SEAL FLEXIBLE MOUNTING

Eugene Alan Plouzek, Tazewell County, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 6, 1975, Ser. No. 619,881
Int. Cl.² F16J 15/34
U.S. Cl. 277—92 10 Claims



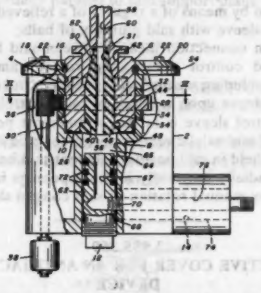
1. In a rotatable face seal assembly having a resilient toric disposed between confronting inclined loading surfaces of a pair of members, said members being operatively coupled to rotatable seal ring means to provide an axial force for effecting a rotatable seal, said members being axially movable relative to each other so as to contain the toric therebetween and allow contacting movement of the toric with respect to the inclined surfaces, the improvement comprising, an insert member of integral one-piece construction and being of flexible material within one of said members defining one of said confronting inclined surfaces, said insert member being descrete from and not bonded to said members so as to be removable therefrom.

3,985,367

WET DRILLING SYSTEM

Eugene J. Martino, Price, Utah, and Irvin W. Walker, Bridgeport, W. Va., assignors to Carmet Company, Pittsburgh, Pa.

Filed Aug. 15, 1975, Ser. No. 604,980
Int. Cl.² B23B 51/06
U.S. Cl. 279—20 6 Claims



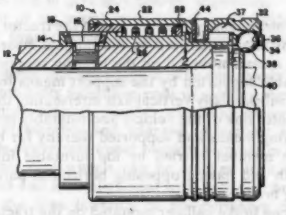
1. Apparatus for underground drilling comprising a housing, an opening in the top of said housing having a bottom therein, a rotatable chuck received in said opening, a vertical bore through said chuck having a non-circular upper portion for receiving a hollow drill rod, a compressible water plug closely received in said chuck bore, said plug having a vertical hole therethrough, a bottom portion bearing against the bottom of said housing opening and a top portion tapering inwardly and upwardly with a portion thereof being adapted to be compressed by the bottom of a drill rod received in said chuck, and means for supplying water to the bottom of said bore.

3,985,368

QUICK-CHANGE SPINDLE NOSE ADAPTER

Bernard R. Better, and Edward Hain, both of Chicago, Ill., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 25, 1974, Ser. No. 526,487
Int. Cl.² B23B 31/22
U.S. Cl. 279—75 3 Claims



1. A quick-change spindle nose assembly for axially positioning a toolholder assembly with respect to a spindle nose comprising:

a holder sleeve adapted to be fit over and fixed to said spindle;

a control sleeve fit over said holder sleeve and adapted to be axially slidable thereon;

means retaining said control sleeve on said holder sleeve so as to allow limited axial movement of said control sleeve on said holder sleeve;

bias means urging said control sleeve to move axially in one direction;

a plurality of balls carried by the holder sleeve in a respective one of a plurality of openings disposed about the periphery of the holder sleeve;

said control sleeve causing said plurality of balls to move radially inwardly to protrude inside said holder sleeve whenever said control sleeve is moved to the extrememost position of said control sleeve on said holder sleeve in said one direction by means of an engagement with a surface formed on the control sleeve, said control sleeve further allowing said balls to move radially outwardly whenever said control sleeve is moved to the extrememost position on said holder sleeve in said other direction by means of a registry of a relieved area on said control sleeve with said plurality of balls;

rotary cam connection means between said holder sleeve and said control sleeve, said rotary cam connection means including means locking said control sleeve to said holder sleeve upon rotation of said control sleeve when the control sleeve is in its extrememost position in the other of said axial directions, whereby said control sleeve may be held in said position whereat said balls are free to move radially outwardly in said openings in said holder sleeve by manual rotation of said control sleeve.

3,985,369

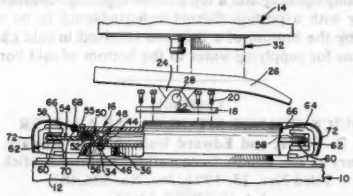
PROTECTIVE COVER FOR AN ANTI-JACK KNIFE DEVICE

William O'Leary, Bishopstown, Ireland, assignor to Artiloc U.S.A. Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 225,325, Feb. 10, 1972, Pat. No. 3,874,699. This application Mar. 27, 1975, Ser. No. 562,762

Int. Cl.[2] B62D *53/10*

U.S. Cl. 280—432 **10 Claims**



1. A coupling means for connecting a tractor vehicle to an articulated trailer so as to prevent jack-knifing of the trailer comprising,

a. support means secured to the rear of the tractor vehicle;

b. a bearing support carried by the support means;

c. bearing means mounted on the bearing support;

d. a turntable supported by the support means for rotation about a substantially vertical axis intersecting the longitudinal center line of the vehicle and rotatably mounted on the bearing means and supported thereby for rotation;

e. a brake member carried by the turntable for rotation therewith and having opposing horizontal parallel faces defining brake surfaces;

f. at least one brake calliper mounted on the tractor vehicle to be restrained from movement about said vertical axis and positioned for operative engagement with said brake surfaces at all articulated positions of the trailer relative to the tractor vehicle whereby upon actuation of the brake calliper articulation of the trailer relative to the tractor vehicle is resisted;

g. means operatively carried by the support means and the turntable for preventing axial movement of the turntable relative to the support means;

h. a fifth wheel coupling secured to the turntable for rotation therewith;

i. means for connecting the trailer to the fifth wheel coupling so that the trailer is fast with the turntable for rotation therewith;

j. a transverse horizontal pivot means operatively connected between the turntable and the fifth wheel coupling to permit the trailer to rise and fall relatively to the tractor vehicle when passing over a surface of varying grade; and,

k. means for protectively covering the brake member and the brake calliper so that they are not exposed to rain and the like elements and are kept clean and dry whereby any possible slippage therebetween when the brake calliper is actuated to grip the brake surfaces is prevented.

3,985,370

COMBINATION SKI BOOT, CLAMP AND SKI HOLDER

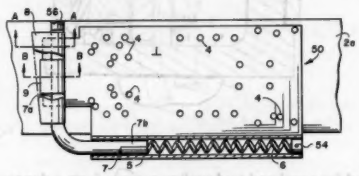
Giorgio Giorgetti, Valdinievole 67, Bientina (Pisa), and Giancarlo Ciacci, Via Brennero 270, Abetone (Pistoia), both of Italy

Filed July 3, 1975, Ser. No. 592,891

Claims priority, application Italy, July 5, 1974, 9506/74

Int. Cl.[2] A63C *7/10, 9/08*

U.S. Cl. 280—605 **6 Claims**



1. A ski boot clamping device, comprising a ski clamp mounting plate having an end with a portion forming a hook, a boot clamp having a first arm portion adapted to extend across the ski for engagement with one end of the boot and having a skirt portion with an engagement end engageable behind said plate raised portion with said hook, said boot clamp having a second arm portion adapted to extend along said ski, means associated with said plate for rotatably supporting said second arm portion so as to permit rotation thereof and pivoting of said first arm portion between a first boot clamping position extending transversely of said ski and a second position in which it is released from the boot and rotated beyond 180° from the first position to extend downwardly into engagement with the snow so as to hold the ski against movement, and a torsion spring connected to said second arm portion and biasing it forwardly against the ski-boot but permitting rearward movement of said second arm portion with said first arm portion to release said engagement end from said hook and to cause said spring to rotate said first arm portion with said second arm portion to said second position.

3,985,371

TOURING SKI BOOT HEEL BINDING

Ewald D. Pyzel, and Harold E. Codding, both of Reno, Nev., assignors to Ski Safe Inc., Carson City, Nev.

Division of Ser. No. 536,971, Dec. 23, 1974, Pat. No. 3,953,042. This application Sept. 22, 1975, Ser. No. 615,807

Int. Cl.[2] A63C *9/08*

U.S. Cl. 280—614 **7 Claims**

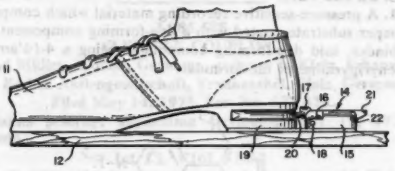
1. A touring ski boot heel binding adapted to be mounted on the upper surface of a touring ski and to releasably engage the heel of a touring ski boot which comprises:

a frame adapted to be secured to the upper surface of a touring ski;

a rotatable heel latch pivotally mounted on the frame, said heel latch being rotatable forwardly to its forwardmost position at which position it is adapted to engage the heel of a touring ski boot and being rotatable rearwardly to its rearwardmost position at which position it is out of engagement with the heel of said ski boot; and

latch engagement and disengagement means for maintaining the heel latch in engagement with the heel of the ski

boot when the heel latch is at its forwardmost position and for maintaining the heel latch out of engagement with the heel of the ski boot when the heel latch is at its rearwardmost position, said latch engagement and disengagement means comprising a spring loaded piston mounted for longitudinal movement on the frame rearwardly of the heel latch with the longitudinal axis of the spring loaded piston disposed generally perpendicular to the axis of rotation of the heel latch, and a connecting rod pivotally



connected to the spring loaded piston and also pivotally connected to the heel latch at a pivot point thereon eccentric with respect to the axis of rotation of the heel latch; the spring loaded piston urging the rotatable heel latch to its forwardmost position when the eccentric pivot connection of the connecting rod therewith is above the axis of rotation of the heel latch and urging the heel latch to its rearwardmost position when the eccentric pivot connection of the connecting rod therewith is below the axis of rotation of the heel latch.

3,985,372

HAND-CART WITH COLLAPSIBLE WHEELS

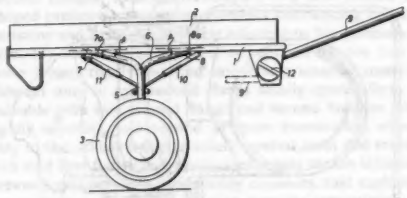
Curt Sigvard Olsson, Bandhagen, Sweden, assignor to SIKOB Svensk Industris Konstrucktions och Berakningskontor AB, Sollentuna, Sweden

Filed Apr. 16, 1975, Ser. No. 568,652

Claims priority, application Sweden, Apr. 22, 1974, 7405394

Int. Cl.² B62B *3/02*

U.S. Cl. 280—652 **4 Claims**



1. A collapsible wheeled cart, particularly a golf cart, comprising a rigid chassis structure defining a support plane and having a center line parallel to the running direction of the cart and capable of supporting a load, for instance a golf bag, on its one side, and two wheel struts provided with wheels at their one ends and having their opposite ends attached to the chassis structure, means cooperating with said wheel struts for retaining said wheel struts in a running position and said wheel struts being collapsible from said running position, in which the wheels are located in parallel planes substantially perpendicular to said support plane of the chassis structure and parallel to said center line of the chassis structure to a collapsed position, in which the wheels are located close to the opposite side of the chassis structure, each wheel strut having its end opposite to the associated wheel journalled in the chassis structure for rotation about an axis which is inclined at an acute angle relative to the direction of said center line of the chassis structure as well as relative to said support plane of the chassis structure, said axis of rotation for the one wheel strut and said axis of rotation for the other wheel strut, respectively, being inclined in mutually opposite directions relative to said center line of the chassis structure as well as relative to said support plane of the chassis structure, so that by rotation of the wheel struts about the axes of rotation from said running position to said collapsed position the wheels are brought into positions side by side in a substantially common plane substantially parallel to said support plane of the chassis structure.

3,985,373

GOLF BAG WITH COLLAPSIBLE CART

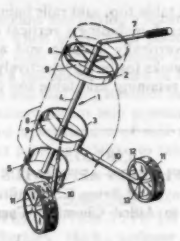
John Gunnar Widegren, Floragatan 10, S-114 31 Stockholm, Sweden

Filed June 25, 1975, Ser. No. 590,240

Claims priority, application Sweden, July 1, 1974, 7408665

Int. Cl.² B62B *1/20*

U.S. Cl. 280—652 **3 Claims**



1. A device for carrying golf clubs, comprising in combination

a. an upper bracket member having an external configuration that approximately defines the outer peripheral configuration of the upper portion of the carrying device,

b. a lower bracket member having an external configuration that approximately defines the outer peripheral configuration of the lower portion of the carrying device,

c. a member interconnecting said upper and lower bracket member so that said upper and lower bracket members are spaced apart from each other in generally parallel planes and in generally coaxial alignment,

d. a pair of leg members mounted on the exterior of said lower bracket member and extending outwardly therefrom,

e. two wheels that are adapted to be detachably mounted on the outwardly extending ends of said leg members,

f. an upper support member extending above said upper bracket member and adapted to support both of said wheels above said upper bracket member in such a manner that said wheels can be stacked in a substantially parallel and axial alignment with both said bracket members, the area inwardly of the periphery of both said bracket members and said wheel members comprising a plurality of openings that can be axially aligned to accommodate the insertion of all of the golf clubs to be carried in the device,

g. a handle member for pulling the assembled device.

3,985,374

AUTOMOBILE PASSENGER'S INDIVIDUAL TABLE

Tadeusz Powaska, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

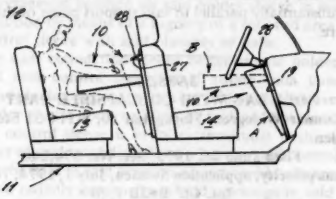
Filed July 7, 1975, Ser. No. 593,793

Int. Cl.² B60R *21/10*

U.S. Cl. 280—730 **3 Claims**

1. In an automobile passenger's individual table the combination of a table top pivotably located in front of passengers of a car, and a pair of stationary rails in which said table top

is vertically adjustable and pivotable between an upward vertical stored position and a rearwardly downwardly horizontal utility position, said table top being made of resilient rubber having a transverse pivot rod near one end extending through a slot, the ends of said rod protruding from each opposite side of said table top and a pair of hooks located on



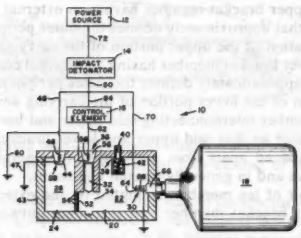
said one end of said table top, said rails being formed of configurated steel and each including a vertical channel in which said rod ends are vertically slidable and a vertical row of inverted U-shaped hooks for being selectively engaged by said table top hooks for retaining said table top in said horizontal position.

3,985,375

INFLATION APPARATUS

Donald J. Lewis, Troy, and Brian K. Hamilton, Utica, both of Mich., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed May 11, 1972, Ser. No. 252,184
Int. Cl.² B60R 21/10
U.S. Cl. 280—737 **17 Claims**



1. Apparatus for variably controlling the burn time of a fixed amount of gas generating material used for inflation purposes, comprising:

a. gas generating means provided with a gas generating material and having a conduit therein;

b. actuating means connected to said gas generating means for igniting said gas generating material upon receipt of a firing command, whereby generated gas flows through said conduit;

c. an impact detector responsive to impact velocities of the vehicle greater than a first, predetermined lower value for transmitting the firing command to said actuating means;

d. blocking means movably mounted adjacent said conduit; and

e. displacing means responsive to impact velocities of said vehicle greater than a second, predetermined higher value for selectively displacing said blocking means into said conduit so as to decrease the cross-sectional area thereof and partially block the flow of generated gas therethrough, whereby the burn time of the gas generating material is decreased and the mass flow rate of said generated gas through said conduit is increased.

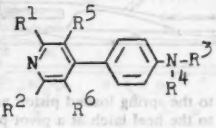
3,985,376

DYE PRECURSORS FOR PRESSURE-SENSITIVE RECORDING MATERIAL

Hans Baumann, Ludwigshafen, and Andreas Oberlinner, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 366,497, June 4, 1973, abandoned. This application Mar. 13, 1975, Ser. No. 558,148
Claims priority, application Germany, June 7, 1972, 2227597
Int. Cl.² B41M 5/22
U.S. Cl. 282—27.5 **6 Claims**

1. A pressure-sensitive recording material which comprises a paper substrate coated with a dye-forming component and a binder, said dye-forming component being a 4-(4'aminophenyl)pyridine of the formula:



in which

R^1 and R^2 are hydrogen, methyl, ethyl, propyl, butyl, phenyl, p-methoxyphenyl, p-ethoxyphenyl, γ-methoxypropyl or p-chlorophenyl,

R^3 is hydrogen, methyl, ethyl, propyl or butyl,

R^4 is methyl, ethyl, propyl, butyl, β-chloroethyl, β-cyanoethyl, phenyl, benzyl, p-methoxyphenyl or p-ethoxyphenyl, and

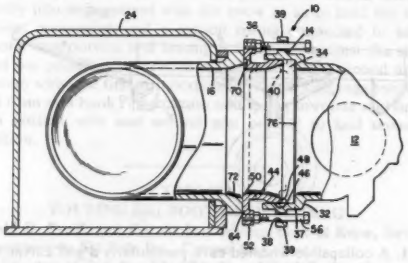
R^5 and R^6 are hydrogen, carbomethoxy, carboethoxy, carbopropoxy or carbobutoxy.

3,985,377

SLIP JOINT CONNECTION FOR ENGINE EXHAUST SYSTEM

Jacob W. Ahola, and Fred A. Rendfeld, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 12, 1975, Ser. No. 586,317
Int. Cl.² F16L 27/02
U.S. Cl. 285—9 R **7 Claims**



1. In an exhaust system including an exhaust manifold attached to an engine which is resiliently mounted to a vehicle frame and an exhaust outlet member which is rigidly mounted to the vehicle frame, a slip joint connection between said manifold and said outlet member, comprising:

an exhaust outlet sleeve rigidly mounted in flow communication with said manifold having a first peripherally outwardly extending portion and an internal cylindrical surface;

only one internal hollow piston, said piston having a second peripherally outwardly extending portion adjacent a first end thereof and having a generally spherical external surface adjacent a second end thereof, the maximum diameter of said spherical surface being substantially equal to the internal cylindrical diameter of said sleeve, said second end of said piston being received in generally

tight relation within said sleeve, said first end of said piston being in the form of a flat annular surface;

a conduit rigidly mounted in flow communication with said outlet member and having a flat annular inlet end adapted to abut radially and flatly in generally tight relation against said first end of said piston; and

means for biasing said second peripherally extending portion away from said first peripherally extending portion sufficiently to forcibly abut said first end of said piston against said inlet end of said conduit.

3,985,378

FLEXIBLE COUPLING

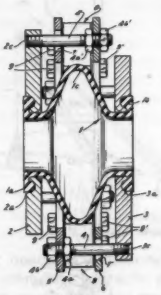
Bernd Müller, Worms, Germany, assignor to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Pfalz, Germany

Filed May 14, 1975, Ser. No. 577,425

Claims priority, application Germany, May 17, 1974, 2424004

Int. Cl.² F16L *51/02*

U.S. Cl. 285—49 **10 Claims**



1. A flexible coupling, particularly a pipe coupling, comprising a spaced-apart first and second flanges; a flexible sound-absorbing compensator disposed between and having first and second end portions respectively secured to said first and second flanges; axially spaced-apart first and second ring-shaped pressure-transmitting elements surrounding said compensator and being respectively adjacent to but normally out of bodily contact with said first and second flanges; first fastener means rigidly securing said first pressure-transmitting element only to said second flange axially spaced from and movable with said second flange and second fastener means rigidly securing said second pressure transmitting element only to the said first flange axially spaced from and movable with said first flange and elastic cushioning means interposed between said pressure-transmitting elements, said cushioning means being compressed by said pressure-transmitting elements in response to movement of at least one of said flanges away from the other of said flanges which results in concomitant movement of said pressure-transmitting elements axially towards one another.

3,985,379

FRICTION JOINT BETWEEN MECHANICAL ELEMENTS

Olov Magnus Normark, Astrakangatan 2, 162 32 Vallingby, Sweden

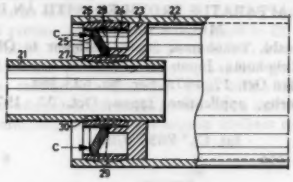
Filed Feb. 2, 1973, Ser. No. 329,179

Claims priority, application Sweden, Feb. 4, 1972, 1350/72

Int. Cl.² F16L *19/08*

U.S. Cl. 285—340 **22 Claims**

1. In a friction joint for interconnecting a plurality of separate elements, at least one of which elements has a generally cylindrical surface, utilizing toggle-like flexible spring locking ring construction, the improvement minimizing deformation of the jointing surfaces of the elements to be joined while permitting greater latitude of surface pressure in a joint capable of providing a friction joint and an effective seal comprising: a sleeve means extending coaxially with said cylindrical surface and being adjustable axially relative thereto, said sleeve means constituting a first part of a locking member for locking the joint in the adjusted position relative to said cylindrical surface; a flexible ring member constituting a second part of said locking member arranged substantially coaxially



with said sleeve means and having a substantially frusto-conical configuration when in unflexed position relative to said sleeve means, at least one peripheral surface of said ring member abutting a peripheral surface of said sleeve member, said sleeve means and said ring member being so dimensioned as to force said sleeve means into pressure contact with said cylindrical surface upon flexure of said ring member into a substantially erect position relative to said sleeve means.

3,985,380

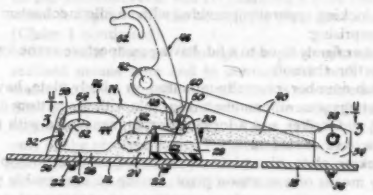
OVERCENTER TYPE LATCH

Roy K. Raivio, Berkley, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1975, Ser. No. 602,995

Int. Cl.² E05C *5/02*

U.S. Cl. 292—69 **3 Claims**



1. An overcenter type latch for securing a pair of relatively movable members to each other comprising, in combination, an elongated retainer for securement to one member and including a pair of laterally spaced recesses adjacent one end portion thereof and an upstanding leg adjacent the other end thereof having a shoulder providing a striker, an elongated handle including a pair of laterally spaced abutments adjacent one end thereof engageable within the recesses of the retainer to pivot the handle to the retainer for movement between an unlatched position and an overcenter latched position wherein the other end of the handle engages the leg to locate the handle in spaced relationship to the retainer, elastomeric link means for pivotal securement to the other member and to the handle, the link means being tensed and extending through the space between the recesses and the abutments when the handle is in overcenter latched position, the pivot of the link means to the handle being overcenter with respect to the pivot of the link means to the other member and the engagement of the abutments with the recesses, and a manually operable latch element pivoted to the handle adjacent the other end thereof and located in the space between the handle and retainer, said latch element including a latch shoulder juxtaposed to the striker shoulder when the handle is in overcenter latched position to block movement of the handle to unlatched position, and a finger engageable portion operable by

the operator inserting his fingers in the space between the handle and retainer and manually grasping the finger portion and handle to pivot the latch element relative to the handle and move the latch shoulder out of juxtaposition to the striker shoulder concurrently with movement of the handle to unlatched position.

3,985,381

LOCKING APPARATUS PROVIDED WITH AN IDLE MECHANISM

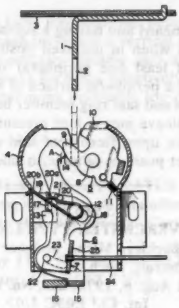
Fumio Kobayashi, Yokohama, Japan, assignor to Ohi Mfg. Co., Ltd., Yokohama, Japan

Filed Oct. 17, 1975, Ser. No. 623,384

Claims priority, application Japan, Oct. 23, 1974, 49-127422

Int. Cl.² E05C *3/06*

U.S. Cl. 292—216 **6 Claims**



1. A locking apparatus provided with an idle mechanism for lids comprising:

a striker firmly fixed to a lid, having an aperture at the lower portion thereof,

a latch member, pivotally mounted on a body plate, having an engagement member engageable with the bottom edge of said striker and a locking notch engageable with said aperture of said striker,

a locking plate, also pivotally mounted on said body plate by means of a common pivot, having an engageable portion, a hooking member to receive said engagement member of the latch member during lid closure, and a flange member thereby enabling a key-operatable plate to push the locking plate in an unlatching direction, and

a releasing lever, pivotally mounted on the body plate by means of said common pivot which is passing through a laterally extending slot disposed at the upper portion of the releasing lever and is usually positioned in engagement with one end of said slot, having a projecting member protruding through an opening of the body plate and a means to turn the releasing lever, whereby it becomes possible to shift the releasing lever to have the said common pivot positioned in engagement with the other end of the said slot so as to cause the releasing lever to disengage with the locking plate irrespectively of the operation of said means.

3,985,382

WEED PULLER

Harold Dale Wheeler, 11441 Acropolis Drive, Yucaipa, Calif. 92399

Continuation of Ser. No. 529,623, Dec. 5, 1974, abandoned. This application Nov. 26, 1975, Ser. No. 635,712

Int. Cl.² A01B *1/16*

U.S. Cl. 294—50.6 **10 Claims**

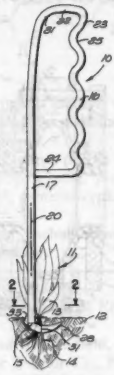
1. A weed puller comprising:

a handle;

a shank which is carried by said handle and projects downwardly therefrom during a weed pulling operation;

two prongs carried by a lower portion of said shank and projecting laterally therefrom generally transversely of said shank in a spaced relation defining a guideway therebetween for receiving a portion of the weed slightly below ground level;

said two prongs having opposed surfaces facing generally toward one another between which said weed is receivable in guided and confined relation, and which, in advancing inwardly toward the shank, have outer first portions which converge relatively rapidly toward one another and define therebetween an entrance throat, and inner second portions which extend more parallel to one another than said outer first portions and form a compression compartment into which said weed is directed by said entrance throat and within which the weed is compressed and tightly frictionally retained to effectively connect the weed to the tool for bodily removal of the weed in its entirety including its roots from the earth by the tool;



said compression compartment having an entrance end opening and facing in a direction generally transversely of and away from said shank and into said entrance throat, and having an exit end opening in an opposite direction generally transversely of said shank for escape of dirt from said exit end of the compression compartment in front of a weed in a self cleaning action, said exit end of said compression compartment being open in said opposite direction throughout substantially the entire vertical extent of the compartment up to essentially the level of the upper surfaces of said prongs at their inner ends adjacent the shank, to thereby enable movement of dirt from the compression compartment through said exit end without abutment against a shoulder obstructing such movement.

3,985,383

INDEXING DEVICE

John L. Yonkers, 2030 Sunset Ridge Road, Northbrook, Ill. 60062

Filed Mar. 3, 1975, Ser. No. 554,676

Int. Cl.² A41D *13/08*; A61F *13/10*

U.S. Cl. 294—25 **4 Claims**

1. An indexing device comprising

a layer of film,

pressure sensitive adhesive material attached to a first side of said film, and

traction material attached to a second side of said film, said layer of film being more rigid than said traction material,

said traction material being of a configuration slightly smaller than that of said layer of film such that an edge

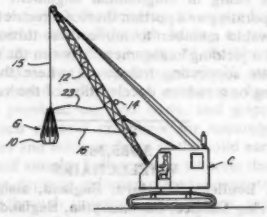
of said layer extends beyond the outer periphery of said traction material.

3,985,384

HYDRAULIC APPARATUS FOR GRAB DEVICE

Oscar W. Hahn, Houston, Tex., assignor to McGinnes Manufacturing Company

Filed Sept. 29, 1975, Ser. No. 617,990
Int. Cl.² B66C *3/16*
U.S. Cl. 294—88 **16 Claims**



1. Apparatus for operating a clamshell bucket having a plurality of bucket elements, hydraulic means for actuating the elements between open and closed positions, a hose means supplying pressurized fluid to and from the apparatus and the hydraulic means, and a reel means for reeling said hose means thereon, the improvement comprising:

hydraulic apparatus for selectively providing pressurized fluid to the hydraulic means;

means with said hydraulic apparatus for regulating flow for providing a first predetermined pressure sufficient to operate the bucket elements from the open to the closed position under loaded conditions;

said flow regulating means providing a second predetermined pressure to said hydraulic means after said bucket elements have been moved from the open to the closed positon; and

said second predetermined pressure having a value sufficient to maintain said bucket elements in the closed position while providing sufficient flexibility of the hose means to facilitate said reeling while maintaining said bucket elements in the closed position under loaded conditions.

3,985,385

TRACTOR CAB MOUNTING APPARATUS

Robert B. Kennicutt, Morton, and William T. Mounts, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

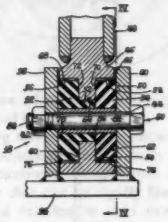
Division of Ser. No. 278,731, Aug. 8, 1972, Pat. No. 3,847,492.
This application Apr. 24, 1974, Ser. No. 463,671
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² B62D *27/04*
U.S. Cl. 296—35 R **7 Claims**

1. In combination with a tractor and a tractor cab, a plurality of mounting means for mounting said cab to said tractor at a plurality of points, each mounting means comprising:

a. a pair of spaced, generally parallel plates extending outwardly from one of the tractor or cab, the plates defining axially aligned apertures;

b. an annular lug member extending outwardly from the other of the tractor and cab and defining a lug aperture having (i) a first cylindrical portion of a first radius, (ii) a second cylindrical portion of a second radius greater than said first radius, and (iii) a radial portion interconnecting the first and second lug member aperture cylindrical portions;

c. annular resilient means having (i) a first external cylindrical portion of a certain radius sized to fit within the lug member first cylindrical portion, (ii) a second external cylindrical portion of a second radius greater than said first resilient means radius to fit within the lug member second cylindrical portion, and (iii) a radial portion interconnecting the first and second resilient means cylindri-



cal portions, one of the lug member aperture cylindrical portions being sized to continuously contact the external resilient means cylindrical portion fitted therein, while the other lug member aperture cylindrical portion is sized to be continuously spaced from the external resilient means cylindrical portion fitted therein, to form an annular gap therebetween, and (iv) defining a bore the axis of which is aligned with the axes of the plate apertures; and, (Claim 1 continued)

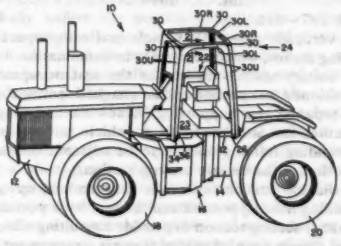
d. shaft means disposed through the plate apertures and resilient means bore and in contact with such resilient means bore, so that the lug member is movable in directions generally perpendicularly to the axis of the shaft means against the resiliency of one cylindrical portion only of the resilient means for a certain amount of travel, and against the resiliency of both cylindrical portions of the resilient means for additional travel.

3,985,386

VEHICLE ROLL-OVER PROTECTIVE STRUCTURE

Terrill Wayne Woods, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sept. 15, 1975, Ser. No. 613,549
Int. Cl.² B62D *27/04*
U.S. Cl. 296—102 **15 Claims**



1. A roll-over protective structure for a vehicle having longitudinally extending frame means supported by wheel

means, comprising: a plurality of tripodal members each having an upright leg bifurcated at the upper end into a right and left leg, and each tripodal member rigidly connected at its right leg to the left leg of a first adjacent tripodal member and at its left leg to the right leg of a second adjacent tripodal member, and said tripodal members having means at the lower ends of the upright legs for mounting the tripodal members on the frame means.

3,985,387

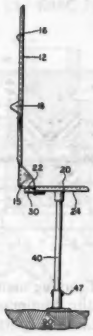
BACK PACK CHAIR

Bernard J. Rischar, 2829 College Ave., Quincy, Ill. 62301

Filed May 2, 1975, Ser. No. 573,950

Int. Cl.² A47C 9/10

U.S. Cl. 297—4 **6 Claims**



1. A collapsible back pack chair adapted to be carried on the back of a user, said chair comprising:

a frame adapted for attachment to the back of a user and having a bottom edge;

a seat having one edge including a pivotal member in cooperation with the bottom edge of said frame;

a leg extending from the bottom of said seat;

means associated with said pivotal member for automatically folding said seat and leg from an open to a stored position when said user releases his weight from the open chair, said leg extending upwardly and adjacent to said frame when said chair is in said stored position; and

means for attaching said chair to the user comprising waist and shoulder straps operably connected to said frame.

3,985,388

VERTICALLY ADJUSTABLE SEAT WITH ENERGY ABSORBING MEANS

Gerard T. Hogan, Southington, Conn., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 11, 1975, Ser. No. 603,471

Int. Cl.² B60R 21/10

U.S. Cl. 297—216 **4 Claims**

1. A vertically adjustable vehicle seat with impact energy-absorbing means, which comprises in combination:

a. a unitary seating section for the seat occupant with a cushioned seat portion and an attached seat back portion,

b. a separate seat supporting framework including a base section for attachment to a vehicle and an upwardly extending framing portion to be adjacent the seat back portion of the unitary seating section,

c. a slidable attachment means between said upwardly extending framing portion and the seat back portion of said unitary seating section to provide a resulting non-pivoting and closely coupled guided support arrangement for such section,

d. an adjustable length weight supporting seat height adjuster means with lower end connection means providing attachment to the lower part of the seat supporting framework and with an upper end connection means to provide attachment to the seat back portion of the seating section, whereby the entire unitary seating section can be adjustably raised and lowered, and

e. at least one end connection means for said height adjuster means being in longitudinal alignment therewith and incorporating as a portion thereof a restricted section and a movable member to move there-through to thereby effect a yielding engagement between the seating section and the supporting framework where there is a crash landing or a sudden deceleration of the vehicle.

3,985,389

WHEELCHAIRS

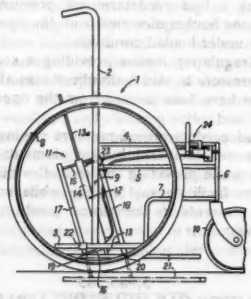
Robert B. Bonfield, Alresford, England, assignor to Bardic Engineering Limited, Southampton, England

Filed June 23, 1975, Ser. No. 589,791

Claims priority, application United Kingdom, July 24, 1974, 32712/74

Int. Cl.² A47C 1/02

U.S. Cl. 297—347 **21 Claims**



1. Elevating means for use with a wheelchair of the type having supporting side frames, said elevating means comprising a pair of extendable frameworks each having a fixed part with means for securement to a respective side frame of wheelchair and a relatively vertically moveable supporting part, and hydraulically actuated lifting means connected between each fixed part and its respective moveable supporting part for moving said moveable support parts downwardly into engagement with a supporting surface to elevate said fixed parts and thereby lift an associated wheel chair.

3,985,390

TUNNEL EXCAVATOR

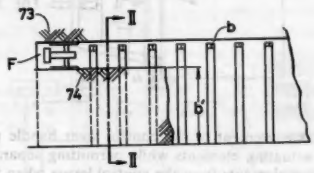
Chiaki Kojima, Tokyo; Hiroshi Ohta, Chigasaki, and Hidekazu Aoki, Tokyo, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 18, 1975, Ser. No. 559,539

Claims priority, application Japan, Mar. 18, 1974, 49-30130; Mar. 18, 1974, 49-30131; Mar. 18, 1974, 49-30132; Mar. 18, 1974, 49-30133

Int. Cl.[2] E21D 9/10, 11/36

U.S. Cl. 299—31 2 Claims



1. A tunnel excavator for forming an upper half annular hollow space within the solid earth having an arch shaped shield provided therein with a plurality of chambers in which excavating machines are located, respectively, each of said excavating machines including an excavator body, earth crushing tools provided on said body, and gripper means provided in each of said chambers for securely abutting against the outer and inner surfaces of the solid earth formed by said upper half annular hollow space, wherein the improvement comprises support cylinder means connected to said gripper means through universal joint means, said support cylinder means rotatably supporting said excavator bodies, respectively, thrust generating means provided in each of said chambers and connected between said gripper means and said excavator body for advancing said excavator body by the action of said thrust generating means when said gripper means is securely abutted against said outer and inner surfaces of the solid earth formed by said upper half annular hollow space, guide means each engaging with the respective excavator bodies so as to permit the same to be swung in an arcuate path, connecting means connecting respectively the adjacent two excavator bodies of said excavator machines so that swinging movement of any one of said excavator bodies is transmitted to the remaining excavator bodies, and swinging means connected to the excavator body of at least one of said excavator machines for permitting the same to be swung by the action of said swinging means.

3,985,391

DISC BRAKE APPARATUS SUITABLE FOR BICYCLES

Neil R. Hoffman, Saukville, and Johannes Hans Jansen, Milwaukee, both of Wis., assignors to Brake Engineering, Inc., Milwaukee, Wis.

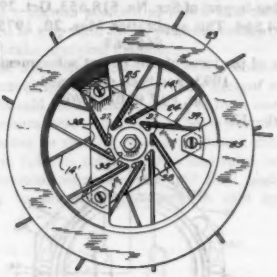
Filed Aug. 21, 1975, Ser. No. 606,711

Int. Cl.[2] B60B 1/00; F16D 65/12

U.S. Cl. 301—6 V 18 Claims

1. A unitary mounting member for securing a rotor disc for a disc-type brake assembly to a wheel of the type having a hub on which there is a circumferential spoke flange with axially opposite inner and outer surfaces, said hub being connected with a rim by means comprising certain wire spokes each of which has a transverse hook portion received in one of a plurality of circumferentially spaced holes in said spoke flange, an adjacent portion that overlies said outer surface of said spoke flange and a head that overlies the inner surface of said spoke flange, said mounting member being characterized by:

A. a substantially flat, plate-like central portion in which there are a plurality of holes, one for each of said certain spokes, said holes being so centered on a circle and spaced from one another therearound as to be arranged to register with said holes in said spoke flange and being of a size to receive the hook portions of said certain spokes so that the mounting member can be confined against edgewise displacement relative to the wheel by said hook portions while being axially confined between



said outer face of said spoke flange and said adjacent portions of said certain spokes;

B. said mounting member having securement portions that are spaced radially outwardly from said central portion and spaced circumferentially from one another and to which a rotor disc can be rigidly fastened in axially outwardly spaced relation to said central portion of the mounting member.

3,985,392

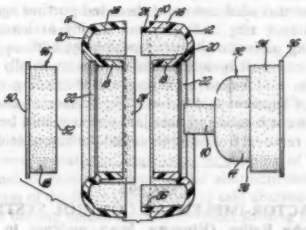
VEHICLE WHEEL ASSEMBLY FOR A TOY VEHICLE

Henry F. Bergmann, Sterling Heights, and Bernard J. Oswald, Fraser, both of Mich., assignors to AMT Corporation, Troy, Mich.

Filed June 16, 1975, Ser. No. 587,423

Int. Cl.[2] A63H 17/26; B60B 5/02

U.S. Cl. 301—63 PW 7 Claims



1. A vehicle wheel assembly for a toy vehicle comprising: a substantially hollow tire portion including two structurally identical mating shells made of a relatively rigid plastic material, each of said shells including an annular outer wall, an inner annular wall generally concentric with said outer wall, and a side wall joining said outer and inner walls along their exterior edges, said shells including means for facilitating mutual alignment and support thereof and being in mating engagement along the outer peripheral centerline of said tire portion; a wheel portion for receiving said tire portion; and retaining means for retaining said shell members in mating engagement with said wheel portion; said wheel portion including a first and a second member and said retaining means comprising means at respective exterior ends of said first and second members for engaging said shells and inwardly facing bonding surfaces at respective interior ends of said wheel members whereby said bonding surfaces are adapted to be

bonded together to retain said shell members in mating relationship.

3,985,393

WHEEL MOUNTING MEANS

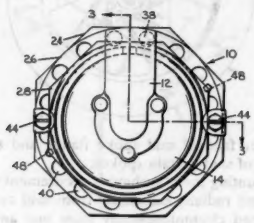
Raymond John Jovick, Troy, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 518,653, Oct. 29, 1974, Pat. No. 3,944,864. This application Mar. 20, 1975, Ser. No. 560,369

The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.

Int. Cl.² B60B *35/00*

U.S. Cl. 301—131 **3 Claims**



1. An improved wheel mounting means of the type which is utilized to secure a wheel on a spindle of an axle, said spindle having a threaded portion outwardly of said wheel mounted thereon and a longitudinal groove axially disposed at the surface of said threaded portion, wherein said improvement comprises:

an adjusting nut threaded onto said threaded portion to make contact with a bearing portion of said wheel;

a keyed lock ring capable of encircling said threaded portion when an inwardly extended key thereof is received within said longitudinal groove, said keyed lock ring being axially positioned against said adjusting nut with said key preventing said keyed lock ring from rotating about said threaded portion;

a jam nut threaded onto said threaded portion against said keyed lock ring, said jam nut having at least one flat working surface at its outer periphery; and

at least one bolt means threaded into an axially disposed hole in said keyed lock ring and extending outwardly thereof adjacent said flat working surface of said jam nut to prevent rotation of said jam nut as would be required for its removal from said threaded portion of said spindle.

3,985,394

TRACTOR-IMPLEMENT CONTROL SYSTEM

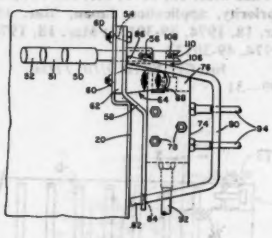
Marlan John Rolfes, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Apr. 7, 1975, Ser. No. 565,867

Int. Cl.² B65G *53/04*, *53/34*

U.S. Cl. 302—34 **13 Claims**

13. In a tractor-trailing implement combination wherein the tractor includes an operator's station enclosed in a cab having a rear wall and the implement is pivotally connected to the tractor and includes a plurality of shiftable functions, the combination therewith of an improved control system for controlling the shiftable functions from within the cab, comprising: a plurality of control levers swingably mounted on the cab rear wall and having handle portions interiorly of the cab and outer portions exteriorly of the cab and shiftable in response to movement of the handle portions; a control package having a plurality of shiftable activating elements respectively operatively connected to the shiftable implement function for shifting the functions in response to movement of the actuating elements; releasable latch means removably mounting the control package on the rear wall of the cab adjacent to the control levers; and means separably connecting the respective control lever outer portions to the control package actuating elements when the control package is mounted on the cab rear



wall so that movement of the control lever handle portions shifts the actuating elements while permitting separation by the actuating elements from the control levers when the control package is removed from the cab rear wall.

3,985,395

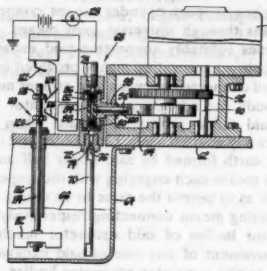
REMOTE CONTROL BRAKE SYSTEM FOR TRAILERS

S. Frank Watanabe, 30420 Lyndon, Livonia, Mich. 48154

Filed July 23, 1975, Ser. No. 598,193

Int. Cl.² B60T *13/68*

U.S. Cl. 303—7 **6 Claims**



6. The combination comprising:

a tractor;

a wheeled trailer connected to the tractor;

an actuator mounted on the tractor so as to be movable in an actuating motion;

braking means mounted on the trailer for engaging a trailer wheel in a braking motion;

hydraulic means including a source of fluid under pressure, said source including an elongated resilient tube having an inlet for receiving fluid, an outlet, a first valve disposed adjacent the inlet, a second valve disposed at the outlet, the tube having a wall movable to a first position to open the inlet valve and to close the outlet valve for receiving fluid in the tube, and a second position in which the inlet valve is closed and the outlet valve is open;

cam means for moving the wall of the tube from said second position to said first position whereby the motion of the tube wall is operative to pass fluid from the tube through the outlet; and

valve means electrically connected to the actuator so as to be operative to fluidly connect the inlet and the outlet of the tube such that the braking means on the trailer is hydraulically actuated in response to an actuating motion of the actuator on the tractor.

3,985,396

METHOD, CIRCUIT, AND APPARATUS FOR ANTI-SKID BRAKE CONTROL IN MOTOR VEHICLES

Kazutaka Kuwana, Toyota, and Hiroyuki Amano, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

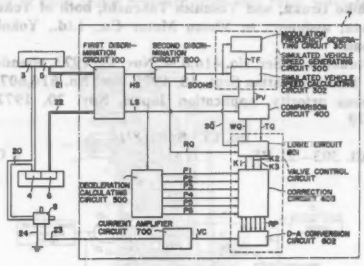
Continuation of Ser. No. 380,096, July 17, 1973, Pat. No. 3,934,938. This application May 12, 1975, Ser. No. 576,795

Claims priority, application Japan, July 20, 1972, 47-72722; Sept. 28, 1972, 47-97419; Sept. 28, 1972, 47-97420

The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.

Int. Cl.² B60T *8/10*

U.S. Cl. 303—21 P **4 Claims**


FIRST DISCRIMINATION CIRCUIT 100
SECOND DISCRIMINATION CIRCUIT 200
MODULATION FREQUENCY GENERATING CIRCUIT 301
SIMULATED VEHICLE SPEED GENERATING CIRCUIT 300
SIMULATED VEHICLE SPEED GENERATING CIRCUIT 302
COMPARISON CIRCUIT 400
LOGIC CIRCUIT 401
VALVE CONTROL CIRCUIT
CORRECTION CIRCUIT 403
D-A CONVERSION CIRCUIT 602
DECELERATION CALCULATING CIRCUIT 500
CURRENT AMPLIFIER CIRCUIT 700

1. An anti-skid control apparatus for an automobile, which comprises:

sensor means for producing outputs corresponding respectively to respective rotating speeds of a plurality of vehicle wheels;

a simulative vehicle speed producing circuit to detect simulatively the wheel speed from the outputs of said sensor means, thereby to produce a simulative vehicle speed signal;

a wheel speed detecting circuit to derive a speed signal of a wheel to be controlled from said outputs of said sensor means;

a deceleration calculating circuit to calculate the deceleration of the wheel to be controlled;

a comparing logical circuit to compare said simulative vehicle speed signal with said wheel speed signal thereby to calculate a slip ratio and to discriminate between a predetermined slip range and other slip ranges; and

control means for increasing braking hydraulic pressure when said slip ratio is above said predetermined slip range to bring said slip ratio within said predetermined slip range, for increasing or decreasing the braking hydraulic pressure in response to acceleration or deceleration of the wheel when said slip ratio is within said predetermined slip range, and for decreasing the braking hydraulic pressure to bring said slip ratio within said predetermined slip range when said slip ratio is below said predetermined slip range.

3,985,397

WHEEL SLIP CONTROL OF HYDRO-PNEUMATIC BRAKE APPARATUS

John G. Cannon, Penn Hills, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 31, 1975, Ser. No. 627,534

Int. Cl.² B60T *8/04*

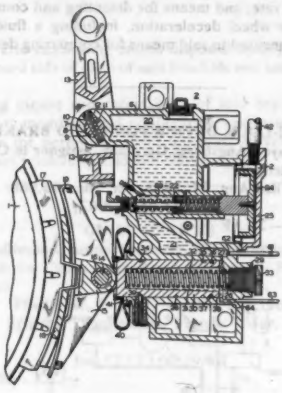
U.S. Cl. 303—21 F **19 Claims**

1. A wheel-slip-responsive power-actuated brake-applying-force relief valve device for interposition in a conduit extending between a master cylinder operable to supply therefrom a fluid under pressure and a brake-applying cylinder that is provided with a piston operable by fluid under pressure supplied thereto from the master cylinder via the conduit to apply a braking force to a vehicle wheel, said relief valve device comprising:

a. a sectionalized casing having therein a plurality of chambers, one pair of said chambers being connected by the conduit respectively to the master cylinder and the brake applying cylinder,

b. valve means operable from a first position in which a communication between said one pair of chambers is open to a second position in which said communication is closed to trap fluid under pressure acting on the piston of the brake-applying cylinder,

c. movable abutment means operatively connected to said valve means for effecting operation thereof and cooperative with said sectionalized casing to form one of said pair of chambers, said one chamber being variable in volume in response to shifting of said abutment means, this increase in volume, subsequent to said valve means closing said communication to trap said fluid under pressure, tending to produce a vacuum in said one chamber



whereby, by reason of communication between said one chamber and said trapped fluid, the pressure of said trapped fluid is relieved, thereby affecting a reduction of the fluid pressure brake-applying force acting on the piston of the brake-applying cylinder,

d. biasing means so disposed as to be normally effective to cause said abutment means to reduce the volume of said one chamber to a minimum, and

e. means operatively responsive to slipping of the vehicle wheel to transmit a force to said abutment means tht is in excess of the force transmitted to said abutment means by said biasing means thereby to effect shifting of said abutment means against the yielding resistance of said biasing means to operate said valve means to close said communication between said one pair of chambers, said shifting of said abutment means being effective to increase the volume of said one chamber thereby effecting a reduction of the fluid pressure brake-applying force on the piston of the brake-applying cylinder.

3,985,398

FLUIDIC ANTISKID CIRCUIT

Henrik H. Straub, Mercer Island, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

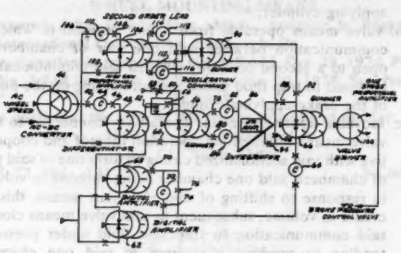
Filed Apr. 8, 1975, Ser. No. 566,158

Int. Cl.² B60T *8/04*

U.S. Cl. 303—21 CG **1 Claim**

1. A fluidic antiskid circuit comprising: a pneumatic wheel speed sensor connected to a wheel; means for determining the

rate of deceleration of the wheel; means for comparing the rate of deceleration with a preselected rate of deceleration, and producing an output signal; valve means connected to a wheel braking system and adapted to receive said output



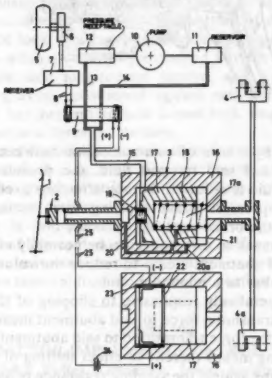
signal whereby braking pressure is varied according to the deceleration rate, and means for detecting and compensating for excessive wheel deceleration, including a fluidic digital amplifier connected to said means for comparing deceleration rates.

3,985,399

ANTI-LOCK DEVICE FOR FLUID BRAKES

Friedrich Mayer, Augsburg, Germany, assignor to Carsec AG, Zug, Switzerland

Filed Aug. 27, 1975, Ser. No. 608,068
Int. Cl.² B60T *8/02*
U.S. Cl. 303—21 AF **7 Claims**



4. In a fluid operated braking system, the combination of: a braking fluid pressurizing main cylinder; at least one wheel brake cylinder; fluid pressure transmitting means operatively interposed between said main cylinder and said wheel brake cylinder, said pressure fluid transmitting means comprising a brake diminishing cylinder for regulating fluid pressure communication between said main cylinder and said wheel brake cylinder, and a piston within said brake diminishing cylinder; first fluid pressure conduit means for connecting said main cylinder and said brake diminishing cylinder, second fluid pressure conduit means connecting said brake diminishing cylinder and said wheel brake cylinder; said piston including a fluid passage therein, said piston being movable between a first position wherein said fluid passage connects said conduits for fluid flow therethrough and a second position wherein fluid flow through said passage and through said conduits is prevented; spring means connected to said piston and operable to bias said piston from said first position toward said second position; a fluid pressure chamber defined by said cylinder and said piston; means for applying fluid pressure to said chamber for biasing said piston from said second position toward said first position in opposition to said spring means; and

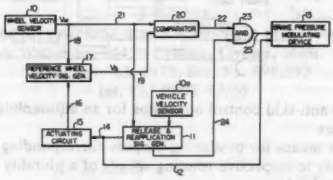
said brake diminishing cylinder and piston including motion intercepting means for reversing movement of said piston when said piston has moved a predetermined distance from said first position toward said second position.

3,985,400

SKID CONTROL SYSTEM

Haruhiko Iizuka, and Yasuhisa Takeuchi, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 416,834, Nov. 19, 1973, abandoned. This application Sept. 18, 1975, Ser. No. 614,607
Claims priority, application Japan, Nov. 20, 1972, 47-115670
Int. Cl.² B60T *8/10*
U.S. Cl. 303—21 BE **6 Claims**



1. A skid control system comprising a vehicle velocity sensor, a wheel velocity sensor, a brake pressure release and reapplication signal generator, and a brake pressure modulating means for modulating the brake pressure in dependence on the release and reapplication signals, which is characterized by;

an actuating circuit to produce an actuating voltage signal in response to the release signal;

reference wheel velocity signal generating means for producing a reference wheel velocity voltage signal in response to said actuating voltage signal and the wheel velocity signal;

a first comparator to produce a gate voltage signal when said wheel velocity signal exceeds said reference wheel velocity voltage signal; and

a gate to pass therethrough said brake pressure reapplication signal when triggered by said gate voltage signal.

3,985,401

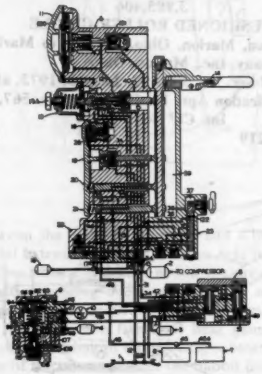
APPARATUS FOR VARYING THE TIME BETWEEN INITIATION AND SUBSEQUENT RELEASE OF AN EMERGENCY BRAKE APPLICATION

Robert J. Worbois, North Huntingdon, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 31, 1975, Ser. No. 627,535
Int. Cl.² B60T *11/26*
U.S. Cl. 303—85 **10 Claims**

1. For use with a locomotive brake control apparatus having a normally charged brake pipe variations of the pressure in which pipe control the application and release of brakes on the locomotive and the cars in a train hauled thereby, a brake valve device operable to control both the supply of fluid under pressure to the brake pipe to cause a brake release and the release of fluid under pressure from the brake pipe at either a service rate or an emergency rate to respectively cause a service brake application or an emergency brake application,

said brake valve device comprising a relay valve for supplying fluid under pressure to said brake pipe and a brake pipe cut-off valve operable to cut off flow of fluid under pressure from said relay valve to said brake pipe, a first reservoir of a chosen volume, and fluid pressure operated valve means including a restricted communication enabling flow of fluid under pressure between said brake pipe and said first reservoir at a service rate of brake pipe reduction whereby said first reservoir is charged from said brake pipe via said restricted communication and said valve means is operable by the fluid under pressure in said first reservoir upon the release of fluid under pressure from the brake pipe only at an emergency rate, and when so operated enables flow of fluid under pressure to said brake pipe cut-off valve to cause operation thereof to cut off flow of fluid under pressure from said relay valve to said



brake pipe and also the release of fluid under pressure from said first reservoir at said service rate until the pressure in said first volume reservoir is reduced to a chosen value thereby preventing an increase of pressure in said brake pipe to cause a brake release prior to the reduction of the pressure in said first reservoir to said chosen value, wherein the improvement comprises:

a. means for controlling the rate of reduction of the pressure in said first reservoir, and

b. a fluid pressure operated valve device operated by fluid under pressure supplied thereto upon operation of said fluid pressure operated valve means in response to the release of fluid under pressure from said brake pipe at only an emergency rate for rendering effective said means for controlling the rate of reduction of the pressure in said first reservoir.

3,985,402

CUSHIONED TRACK ROLLER FOR TRACK-TYPE VEHICLES

Harold L. Reinsma, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 16, 1974, Ser. No. 506,566

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

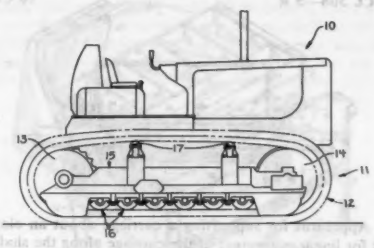
Int. Cl.² B62D 55/16

U.S. Cl. 305—27 **12 Claims**

1. In a track-type vehicle of the type having a pair of longitudinally extending sub-frames disposed on either side thereof and an endless track entrained about each of said sub-frames to engage a plurality of longitudinally spaced rollers, each rotatably mounted on a shaft secured to a respective sub-frame, the improvement wherein each end of said shaft is mounted in cushioned mounting means comprising

a pair of longitudinally spaced support members secured to each sub-frame to extend downwardly thereon in straddling relationship with respect to each end of said shaft,

a bracket mounted on each end of said shaft and extending longitudinally between said support members,



elastomeric cushioning means disposed axially between an outboard side of each of said brackets and said sub-frame, and

retaining means supporting ends of said bracket on said support members and cooperating with said cushioning means for permitting slight universal movement of said bracket relative to said sub-frame.

3,985,403

GUIDE DEVICES

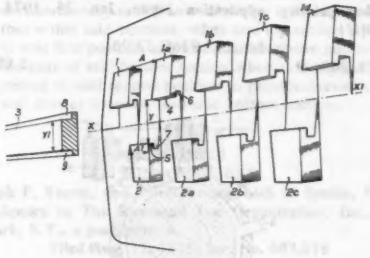
Roland Gallinato-Contino, Nanterre, France, assignor to Regie Nationale des Usines Renault and Automobiles Peugeot, both of France

Filed Mar. 4, 1975, Ser. No. 555,116

Claims priority, application France, Mar. 27, 1974, 74.10579

Int. Cl.² F16C 29/00

U.S. Cl. 308—3.6 **4 Claims**



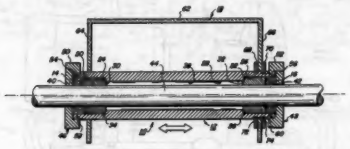
1. The combination of a slidable element and a guide device comprising a slidable element and a guide device therefor, said guide device comprising a pair of parallel elongated members in face to face relationship, located around a central axis, each member having a plurality of studs, the distance between two studs being at least equal to the width of each of the studs on the other member, the studs being staggered and being so located that corresponding to each stud on one member is a free space between two studs in the other member, the parallel faces of the studs which are closest to each other and the slidable element having means for interengagement when the slidable element is inserted between said two members, the width of the slidable element corresponding to the distance between said elongated members.

3,985,404

CARRIAGE SUPPORT APPARATUS

Mario G. Plaza, Fremont, and Richard D. Trezise, Newark, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed June 20, 1975, Ser. No. 588,995
Int. Cl.[2] F16C 33/72
U.S. Cl. 308—5 R 10 Claims



1. Apparatus for supporting a carriage about an elongate shaft for linear movement of the carriage along the shaft, the apparatus comprising:

an elongate tubular housing to which a carriage may be mounted, said housing having opposing normally open ends;

a pair of linear bearings mounted in said housing in spaced apart relation adjacent respective opposing ends of said housing, said bearings having aligned openings through which an elongate shaft may be disposed in contacting relatively movable relation; and

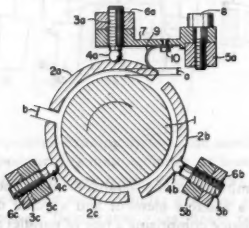
means included in said housing for lubricating said bearings during movement of the housing along an elongate shaft disposed therethrough, said means for lubricating including a pair of lubricating members respectively associated with the pair of linear bearings, each lubricating member being fabricated of an absorbant material and having a central opening through which an elongate shaft may be disposed in contacting relatively movable relation.

3,985,405

GAS BEARING ASSEMBLY

Hiroshi Okano, and Teru Morishita, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 29, 1974, Ser. No. 501,832
Claims priority, application Japan, Jan. 24, 1974, 49-10029[U]
Int. Cl.[2] F16C 32/06
U.S. Cl. 308—9 5 Claims



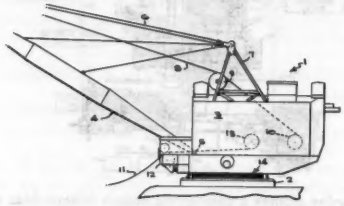
1. In a gas bearing assembly for a rotary shaft including a plurality of pads concentrically arranged about said shaft each defining an arcuate inner surface arranged to extend circumferentially of said shaft in proximity thereto, said pads being arranged such that there is provided at least one non-load bearing pad which does not receive the load of said shaft and at least a plurality of load-bearing pads which receive the load of said shaft, first pivot means connected to a fixed support and having said load-bearing pads pivotally supported thereon, and second pivot means connected to a fixed support through a resilient interconnecting member and having said non-load bearing pad pivotally supported thereon, each of said pads being positioned to have a leading edge and a trailing edge spaced apart circumferentially of said shaft and being defined relative to the direction of rotation of said shaft, with each of said pivot means being respectively connected to each of said pads at a point on the side of said pads toward the leading edge thereof, the improvement comprising spring means provided separately from said second pivot means connected to abut said non-load-bearing pad at said leading edge thereof at a point spaced from the point from which said second pivot means supports said non-load bearing pad to impart a force biasing said non-load bearing pad radially inwardly of said shaft at a point proximate said leading edge thereof.

3,985,406

CUSHIONED ROLLER CIRCLE

George B. Baron, Marion, Ohio, assignor to Marion Power Shovel Company, Inc., Marion, Ohio

Continuation of Ser. No. 380,199, July 13, 1973, abandoned.
This application Apr. 14, 1975, Ser. No. 567,772
Int. Cl.[2] B66C 23/84
U.S. Cl. 308—219 17 Claims



1. In a machine such as an excavator or crane having an upper frame provided with an eccentrically disposed load centroid, rotatably mounted on a lower frame, an assembly for supporting said upper frame and other components mounted thereon on said lower frame comprising a lower circular rail consisting of a plurality of arcuate segments disposed in end to end relation secured to said lower frame, a cage having a plurality of rollers disposed in contact with an upper bearing surface of said lower rail, an upper rail consisting of a plurality of arcuate segments disposed in end to end relation secured to said upper frame, having a lower bearing surface in contact with said rollers, and padding consisting of an elastically deformable material interposed between at least one of said upper and lower rails and an adjacent upper or lower frame, said material having sufficient strength to support the design load imposed on said rollers, sufficient elasticity to permit vertical and horizontal displacement between each segment of said rail and said adjacent frame and a sufficiently low modulus of elasticity to effect a more uniform distribution of the load imposed on said rollers.

3,985,407

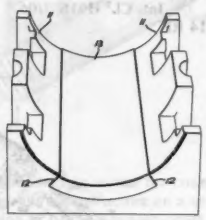
BEARINGS FOR RAILWAY VEHICLES

Robert Oliver, Hargrove; William John Waterman, Bourne End, and Hamish Dundas Wilson, Maidenhead, all of England, assignors to Vandervell Products Limited, England

Continuation of Ser. No. 335,131, Feb. 23, 1973, abandoned.
This application Dec. 19, 1975, Ser. No. 642,245
Int. Cl.[2] F16C 17/00
U.S. Cl. 308—237 R 1 Claim

1. In combination with the journal on a railway vehicle wheel set, a bearing for said journal comprising an elongate generally rectangular block consisting of a cast aluminium silicon alloy containing only a minimal amount of copper on

the order, at most, of not more than 1% and having a heat transfer coefficient of not less than 0.20 cgs units, the block having end faces and an upper and lower elongate side, said upper side being substantially flat and said lower side being part cylindrical and being composed of a central longitudinally extending segment which extends over an arc located within the part cylindrical side and longitudinal side segments extending downwardly from the side boundaries of the central segment, said central and side segments having their longitudinal axes extending mutually parallel along the length of the



block between the end faces thereof and a bearing lining of babbit metal extending along the lower side of the block and being confined laterally solely within the area of the central segment and extending over the end faces in line with the central segment, and under which the journal rotates in engagement therewith, the frictional heat generated between said journal and the babbit lining being substantially localized in the zone of the crown area of the babbit lining, and a heat transmitting metallic path at such zone to conduct the heat upwardly into the air stream.

3,985,408

BEARING HAVING IRON SULFUR MATRIX

John C. Bierlein, Royal Oak, and Edward J. Shipek, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 10, 1975, Ser. No. 621,495
Int. Cl.² F16C *27/00*
U.S. Cl. 308—237 R **5 Claims**

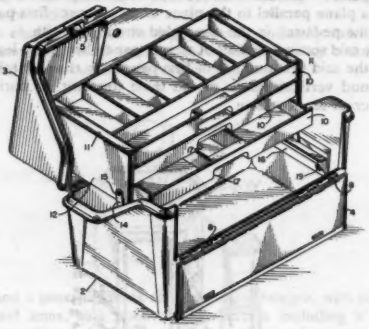
1. A bearing comprising:
a steel backing,
a porous metal matrix bonded to said backing,
said matrix consisting essentially by weight of about ½ to 6 percent sulfur, 0 to 60 percent copper and the balance iron, and
a babbitt overlay filling at least the surface pores of said matrix.

3,985,409

TACKLE BOX

Joseph W. Kneier, Chesterland, Ohio, assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Aug. 13, 1975, Ser. No. 604,170
Int. Cl.² A47B *51/00, 81/00*
U.S. Cl. 312—271 **7 Claims**



1. A tackle box assembly comprising:
a plurality of drawer trays disposed for vertical support on horizontal guide means;
said horizontal guide means being disposed in vertical guide means in stacking relationship such that the drawer trays may be independently extended horizontally for a first means of access and lifted vertically with the horizontal guide means in any combination as a second means of access;
said vertical guide means being disposed within a box-like container means;
said container means has at least a top and a bottom section for containing said drawer assembly;
said top section is movable from a first position whereby it forms a closed container in cooperation with said bottom section, to a second position whereby said container is open; and
said vertical guide means is attached by pivot means to said top section and by cantilever link means to said bottom section thereby said drawer assembly is moved to a position within said container when said top section is moved to said first position and to a position above and towards the rear of said bottom section when said top section is moved to said second position to provide access to both said drawer assembly and said bottom section.

3,985,410

MINIATURE BAR

Joseph P. Young, and Sylvia Young, both of Seattle, Wash., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

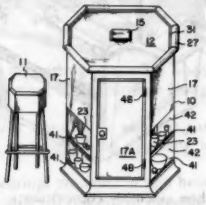
Filed Aug. 11, 1975, Ser. No. 603,619
Int. Cl.² A47B *51/00*
U.S. Cl. 312—306 **1 Claim**

1. A table bar assembly comprising,
a hollow pedastal and
a table top unit slidably mounted in the pedastal so as to travel along the vertical axis of the pedastal between
an extended position in which the table top unit extends above the pedastal and
a retracted position in which the table top unit is enclosed within the pedastal,
said table top unit fitted with a top panel that serves as an exposed table platform for the assembly in both the said extended and said retracted positions
said pedastal formed of a first number of first vertical panels oriented to form a polygon in horizontal cross-section,

with one of said first vertical panels hinged to the pedastal along the vertical axis of the pedastal to form a door to the interior of the pedastal,

said table top unit comprising a frame to which the table top panel and a shelf below the underside of the table top panel are mounted to a second number of second vertical panels extending below the underside of the said table top panel, with each of said second vertical panels aligned in a plane parallel to the plane of an adjacent first panel of the pedastal, in the assembled condition, with

the said second number of second panels being one less than the said first number of first panels, so that the said second vertical panels of the table top unit, in horizontal cross-section form



a polygon similar to the polygon formed by the pedastal vertical panels, with one vertical side of the table top unit polygon being open to provide access to the said shelf from one side of the assembly, while the remaining said second vertical panels serve to conceal the said shelf, such that in

the extended position of the table top unit, above the pedastal, the assembly serves as a bar, with the shelf providing storage space accessible and visible from only one side of the assembly, and in

the retracted position of the table top unit, inside the pedastal, the assembly serves as a table with access to the shelf of the table top unit provided by the door of the pedastal unit,

said table top unit held in the extended position, by latching means fixed to a vertical panel of the table top unit.

3,985,411

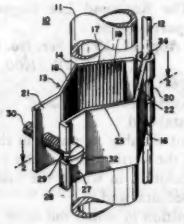
HINGED GROUND CLAMP

Thomas Mooney, Hungtington Station, N.Y., and John Clark, Willow Springs, Ill., assignors to I-T-E Imperial Corporation, East Farmingdale, N.Y.

Filed June 30, 1975, Ser. No. 591,409

Int. Cl.² H01R 3/06

U.S. Cl. 339—14 L **8 Claims**



1. A conduit coupling assembly comprising a longitudinally extending cable, a longitudinally extending conduit laterally spaced from said cable, a pair of clamp members embracing said conduit and provided along their proximal longitudinal edges with hinge knuckles engaging said cable and terminating at their distal ends in outwardly laterally projecting wings, one of said wings having a tapped bore and the other of said wings having an opening directed toward said bore, and means comprising a screw registering with said opening and engaging said bore for transversely drawing the distal ends, of said clamp members toward each other to contact said clamp members relative to each other.

3,985,412

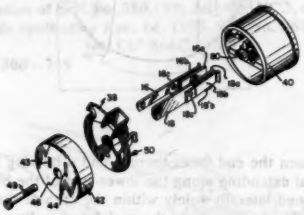
GROUNDING ELECTRICAL ADAPTER

Ernest Gerhard Hoffman, Middlefield, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Jan. 29, 1976, Ser. No. 653,342

Int. Cl.² H01R 3/06

U.S. Cl. 339—14 RP **6 Claims**



1. A grounding electrical adapter for electrically coupling a plug having two powerline male terminals and a grounding male terminal to a powerline receptacle having an outlet socket with two powerline female terminals, said receptacle having a receptacle plate secured to an electrically grounded portion of the receptacle with a removable, electrically conductive screw spaced along the plate from the socket, said adapter comprising:

an adapter body made of an electrically insulating material and having a back end with openings for receiving the male terminals of a plug when the plug is plugged into the adapter;

two adapter male terminals secured to the adapter body and extending forwardly of a front end thereof, said adapter male terminals shaped and disposed to be received and make electrical contact with the female terminals of a receptacle socket into which the adapter is plugged in;

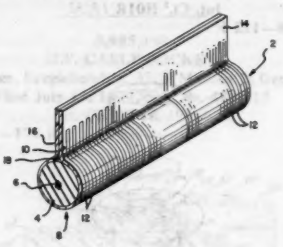
means disposed within the adapter body and electrically connecting the adapter male terminals to the powerline male terminals of a plug plugged into the adapter; and

grounding assembly means having a portion disposed within the adapter body and a portion disposed outside the adapter body, said grounding assembly means moveable between: (a) an operative position in which, when the adapter is plugged into the receptacle socket, the outside portion of the grounding assembly means is aligned with the grounded screw of the receptacle and the inside portion of the grounding assembly means makes electrical contact with the grounding male terminal of a plug plugged into the adapter; and (b) an inoperative position in which when the adapter is plugged into a receptacle, the outside portion of the grounding assembly means is offset from the grounding screw of the receptacle along a plate and the inside portion of the grounding assembly means blocks the opening for the grounding male terminal of a plug and prevents plugging in the plug into the adapter while the grounding assembly means remains in its inoperative position.

3,985,413
MINIATURE ELECTRICAL CONNECTOR

William Robert Evans, Clemmons, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 419,004, Nov. 26, 1973, abandoned. This application Sept. 6, 1974, Ser. No. 503,884
Int. Cl.² H05K *1/07*
U.S. Cl. 339—17 LM 5 Claims



1. An electrical connecting means for connecting conductors on a first substrate to conductors on a second substrate, said substrates being in parallel spaced-apart relationship to each other, said connecting means comprising:

a generally cylindrical relatively elongated connector body of elastomeric material, said body being of a material of the class known as elastomers, an elastomer being characterized by the fact that it will stretch under a low stress to at least twice its length and will snap back to its original length on release of the stress,

said connector body having an axially extending central core of non-yielding material extending therethrough, said elastomeric material being bonded to said core,

a flexible circuit comprising a thin film of non-yieldable insulating material, said film having a width which is greater than the circumference of said connector body and having on one surface thereof a row of closely-spaced straight line conductors, said conductors having a uniform length, said uniform length being less than the width of said film whereby portions of said film on each side of said row are devoid of said conductors,

said flexible circuit being wrapped around said connector body with said row of conductors facing away from said body whereby said body has on its surface parallel spaced-apart conductors which extend therearound, said marginal side portions having there surfaces against, and bonded to, each other.

3,985,414
BUS CLIP AND BUS STRIP CONSTRUCTION

Leo Walter, Palos Verdes Peninsula, and Helmut W. Greul, Malibu, both of Calif., assignors to Electronics Stamping Corporation, Gardena, Calif.

Continuation-in-part of Ser. No. 503,674, Sept. 6, 1974, Pat. No. 3,918,788. This application June 13, 1975, Ser. No. 586,493
The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.
Int. Cl.² H01R *11/20, 31/08*
U.S. Cl. 339—19 7 Claims

1. In a clip operable to connect an electrical terminal post with a bus strip,

a. a channel section having generally upwardly extending, laterally spaced and opposed arms forming a zone in which the bus strip is receivable,

b. and a generally hook shaped section integral with one of said arms, said hook shaped section including a tang extending downwardly at the lateral side of said one arm opposite the other arm of the channel shaped section, the tang also laterally aligned with said other arm, said hook shaped section containing an opening to pass said terminal post in vertically oriented relation between said tang and said one arm, and

c. there being at least one protuberance on said channel shaped section and defining a tip pointed toward said zone to penetrate into the bus strip upon its reception in said zone.

7. In a clip operable to connect an electrical terminal post with a bus strip,

a. a channel section having generally upwardly extending, laterally spaced and opposed arms forming a zone in which the bus strip is receivable,

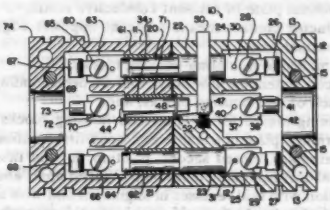
b. and a generally hook shaped section integral with one of said arms, said hook shaped section including a tang extending downwardly at the lateral side of said one arm opposite the other arm of the channel shaped section, the tang also laterally aligned with said other arm, said hook shaped section containing an opening to pass said terminal post in vertically oriented relation between said tang and said one arm, and

c. and including said bus strip closely received in said zone, there being a boss on the bus strip received in a recess formed by the other of the channel section arms, said other arm being dimpled to form said recess.

3,985,415
LOCKING PLUG AND RECEPTACLE THEREFOR

Richard W. Wolpert, Roslyn Heights; Alan T. Wolpert, Massapequa; John F. Bender, Baldwin, and Harold McCormick, Roosevelt, all of N.Y., assignors to Union Connector Company, Inc., Roosevelt, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,629
Int. Cl.² H01R *13/20*
U.S. Cl. 339—74 R 1 Claim



1. A locking electrical plug and a receptacle therefor comprising, in combination, a plug having a casing containing a lateral slot and having a cover over said slot, a locking prong extending from said casing, said locking prong having a shank fixed in said casing and containing a longitudinal slot, two conducting prongs extending from said casing on each side of said locking prong, said conducting prongs having shanks and means for making electrical connections thereto within said casing, said shank of one of said conducting prongs extending across said lateral slot in said casing, a locking hook in said longitudinal slot of said locking prong, said locking hook having a lateral hook projection outside said casing and a locking hook shank terminating within said casing, a release button projecting laterally from said casing and being slidably

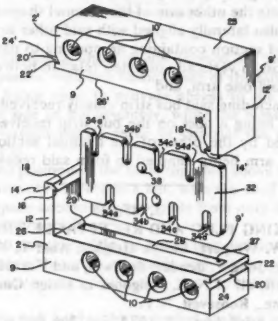
disposed in said lateral slot of said casing, said release button containing a lower notch through which the shank of one of said conducting prongs extends limiting lateral movement of said release button, a pin connecting said release button to said shank of said locking hook, and a compression spring in said slot of said casing urging said release button outward from said casing and pivoting said locking hook to extend said lateral hook projection from said longitudinal slot in said locking prong; and a receptacle for said plug having tubular prong receiving elements to receive said prongs of said plug therein, said tubular prong receiving element receiving said locking prong containing a lateral opening to receive said lateral hook projection therein locking said plug to said receptacle.

3,985,416

OPPOSED EDGE SLOTTED TERMINAL ELECTRICAL CONNECTOR

Frank Peter Dola, Port Richey, and Frederick William Rossler, Jr., New Port Richey, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 5, 1975, Ser. No. 555,484
Int. Cl.² H01R *11/20*
U.S. Cl. 339—98 **8 Claims**



1. A two-position electrical connecting device for forming an electrical connection between a plurality of insulated conductors comprising:

a terminal plate of resilient conductive metal,

conductor contact means adjacent opposite edges of said terminal plate,

two mateable insulating housing blocks,

a recess extending inwardly from a corresponding face on each of said housing blocks, and

retaining means for holding said housing blocks and said terminal plate in a stationary, open first position and in a stationary, closed second position, in said first position said corresponding faces being spaced apart and in opposition with said recesses in alignment and with said terminal plate partially within each of said recesses and supporting said housing blocks, said housing blocks being movable relatively towards each other into said second position, said retaining means comprising detent means on each housing block for engaging the other housing block and resisting separation of said blocks in said first and in said second positions, and raised surface means on said terminal plate for resisting complete insertion of said terminal plate into said recesses and relative movement of said housing blocks from said first position to said second position, said terminal plate being movable relative to both of said housing blocks during movement from said first position to said second position,

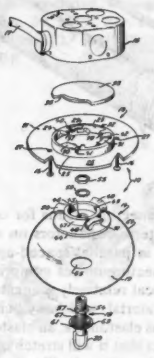
whereby wires may be placed in alignment with said contact means and transverse to said terminal plate when said housing blocks are in said open first position, and upon movement to said closed second position, permanent electrical contact is established between said wires and said terminal plate.

3,985,417

COUPLING DEVICE FOR ELECTRICAL FIXTURE

Hugh Miles Roxburgh Fenton, Vancouver, Canada, assignor to Russell William Richardson, Coquitlam, Canada

Filed Apr. 24, 1975, Ser. No. 571,059
Int. Cl.² H01R *13/32*
U.S. Cl. 339—122 F **10 Claims**



1. An electrical fixture coupling device for coupling releasably an electrical fixture to an electrical outlet adjacent a building surface, the device having a female assembly serving as the electrical outlet and adapted to be connected to electrical power and to be attached to an outlet box, and a complementary male assembly connected to the electrical fixture, the female assembly including:

i. a hollow body having an inner surface and upper and lower ends,

ii. attachment means cooperating with the body for connecting the body to the outlet box so that the female assembly is essentially adjacent the building surface,

iii. three circumferentially spaced female supporting and contacting means extending inwardly from the inner surface of the body, each supporting and contacting means having a circumferentially extending female lug having bi-directional rotation restricting engagement means and an electrically conducting resilient contact member secured adjacent the lug and adapted to be connected to an appropriate conductor, the contact member having a forward edge spaced upwards of the lug to provide a gap between the lug and the contact member,

the male assembly including:

iv. an outer plate having means to permit electrical connection to electrical conductors extending from the electrical fixture, and means adapted to carry the fixture,

v. three similarly circumferentially spaced male supporting and contacting means extending upwards from the plate, each male supporting and contacting means having a circumferentially extending male lug having bi-directional rotation restricting engagement means complementary to the respective engagement means of the female lug and an electrically conducting contact member extending along an upper surface of the male lug and adapted to be connected to an appropriate conductor of the fixture, each lug and contact member of the male assembly being adapted to be accepted in the gap between the respective lug and contact member of the female assembly.

so that when the lugs of the male assembly are moved into the respective gaps of the female assembly and the male assembly is rotated relative to the female assembly, the engagement means of each female lug engages the complementary engagement means of the respective male lug so as to restrict rotation between the male and female assemblies to prevent substantially accidental disconnection of the assemblies, and the respective contact members are forced into and maintain engagement so as to conduct electricity.

3,985,418

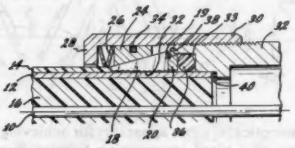
H.F. CABLE SOCKET

Georg Spinner, Erzgiebereistr. 33, 8 Munich 2, Germany

Filed July 12, 1974, Ser. No. 488,013

Int. Cl.[2] H01R *17/04*

U.S. Cl. 339—177 R **8 Claims**



1. Socket connection with a coaxial cable having an inner and outer conductor, comprising:

a sleeve; an annulus with inner conical surface, axially movably disposed in the sleeve;

a hollow, externally conical member of variable inner diameter for receiving and disposition on the outer conductor and coacting with the annulus to clamp the conical member onto the outer conductor;

the annulus and the conical member remaining axially movable relative to each other inside of the sleeve except for the engagement of the conical surfaces;

spring means in the sleeve acting against the annulus and urging the annulus onto the conical member for reducing its diameter and clamping action thereon, the spring being sufficiently strong so that it continues to shift the annulus onto the conical member due to being axially movable, and to thereby supply the clamping force exerted by the conical member upon the outer conductor even after yielding of the outer conductor as a result of such clamping action;

a socket element in electrical contact with the outer conductor and connected to the sleeve, the socket element having an annular recess; and a sealing ring in the recess bearing against the outer conductor and against the conical member at one end thereof, said end facing axially away from the annulus.

3,985,419

METHOD OF MAKING A SYNTHETIC FOCUSED IMAGE HOLOGRAM

Kazuya Matsumoto, Yokohama, and Akio Yano, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

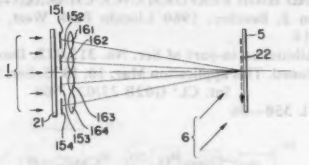
Continuation of Ser. No. 393,882, Sept. 4, 1973, abandoned, which is a continuation of Ser. No. 186,602, Oct. 5, 1971, abandoned. This application May 8, 1974, Ser. No. 468,291

Claims priority, application Japan, Oct. 5, 1970, 45-87358; Nov. 13, 1970, 45-100515

Int. Cl.[2] G03H *1/28*

U.S. Cl. 350—3.5 **7 Claims**

1. A method of producing and viewing a hologram, comprising the step of arranging adjacent each other in a non-overlapping manner a plurality of separate component pictures having respectively different image information for illumination, the step of illuminating the component pictures with a coherent light source through diffusion means positioned between the component pictures and the coherent light source, the step of forming substantially fully overlapping images of the plurality of component pictures on a hologram recording medium with image-forming optical means, the step of directing a coherent reference beam on the hologram recording medium to obtain a hologram, the step of illuminating the hologram with reconstructing light so that images of the component



pictures and an image of the image-forming optical means are reproduced by the reconstructing light, the setp of arranging a plurality of component pictures includes the step of arranging pictures having different parallax information of one object, whereby the images of the component pictures can be viewed at the position of the image of the image-forming optical means.

3,985,420

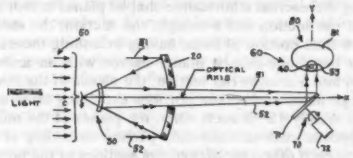
MECHANICAL STEP SCANNER

Ronald M. Grose, Bolton, Conn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 10, 1975, Ser. No. 621,337

Int. Cl.[2] G02B *27/17*

U.S. Cl. 350—7 **5 Claims**



1. A mechanical step scanner, adapted for use in high-resolution high-speed tracking of an image, wherein said image has an optical path, comprising:

a. a first step drive unit which includes:

1. a first rotatable reflector disc in optical alignment with said optical path of said image to be tracked, wherein said first reflector disc is divided into a first plurality of segments which are optically flat, are in parallel spaced relationship to each other, and are of a predetermined total in number.

2. and, a first means for rotating said first rotatable reflector disc at a preselected speed;

b. and, a second step drive unit, in cooperative association with said first step drive unit, which includes:

1. a second rotatable reflector disc in optical alignment with said first rotatable reflector disc, wherein said second reflector disc is divided into a second plurality of segments which are optically flat, are in parallel spaced relationship to each other, and are of a predetermined total in number, and wherein each said segment of said second plurality of segments is further divided into a plurality of multiplicity of sections, which said sections in any said multiplicity are coplaner and are in uniform spaced relationship to each other, and also wherein each said multiplicity of sections consists of a total number of sections that is equal to a positive integer multiple of said total number of segments in said first plurality of segments;

2. and, a second means for rotating said second rotatable reflector disc at a preselected speed in synchronization with said preselected speed of said first rotatable reflector disc.

3,985,421

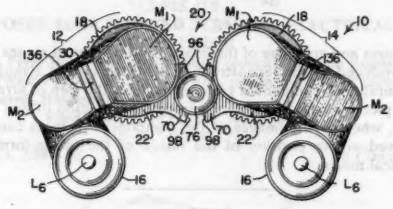
BINOCULAR HAVING SMALL SIZE, LIGHTWEIGHT, AND HIGH PERFORMANCE CHARACTERISTIC

William J. Beecher, 1960 Lincoln Park West, Chicago, Ill. 60614

Continuation-in-part of Ser. No. 312,022, Dec. 4, 1972, abandoned. This application Mar. 10, 1975, Ser. No. 556,737

Int. Cl.² G02B 23/02, 7/06

U.S. Cl. 350—36 **10 Claims**



1. A binocular comprising two telescopes hingedly connected together for swinging movement toward and away from each other, each telescope embodying upper and lower generally frusto-conical tubular shell portions which have their axes positioned at a right angle to each other and are arranged with the small base of the upper shell portion intersecting the small base of the lower shell portion in offset relationship, the large base of each shell portion having extending thereacross a horseshoe-shaped planar mirror with an arched rim section and a straight rim section, the small base of each shell portion likewise having extending thereacross a similar horseshoe-shaped planar mirror with an arched rim section and a straight rim section, the planes of the mirrors at the large bases of the shell portions extending at an angle of approximately 45° to each other, the planes of the mirrors at the opposite ends of each shell portion extending at a right angle to each other, the arched rim sections of the horseshoe-shaped mirrors at the small bases of the shell portions being approximately tangential, the straight rim sections of the horseshoe-shaped mirrors at the ends of the upper shell portion being disposed in close opposed parallel relation, the straight rim sections of the horseshoe-shaped mirrors at the ends of the lower shell portion being in opposed parallel relation and disposed apart a distance substantially greater than the distance between the straight rim sections of the horseshoe-shaped mirrors at the ends of the upper shell portion, the large base of the upper shell portion being provided with a circular objective aperture in opposed relation with the adjacent horseshoe-shaped mirror therein, the large base of the lower shell portion being provided with a circular eyepiece aperture in opposed relation with the adjacent horseshoe-shaped mirror therein, the planes of said objective and eyepiece apertures each extending at an angle of approximately 45° to the plane of the adjacent mirror, and being disposed in close parallelism, a lens-containing objective barrel seated within said objective aperture and extending closely alongside of one pair of right angularly disposed mirrors, and a lens-containing eyepiece barrel seated within said eyepiece aperture and extending closely alongside of another pair of right angularly disposed mirrors, the upper and lower shell portions of each telescope being of such size or proportion that the mirrors at the small bases thereof are disposed without overlap in the direction of the line of sight and the mirrors at their large bases overlap only slightly in the direction of the line of sight to the end that the linear distance between the outer remote surfaces of the eyepiece and objective lenses of each telescope is less than one-half the extreme width of the binocular when the two telescopes of the latter are swung apart to their fullest extent, the four mirrors of each telescope being arranged in Porro-type relation.

3,985,422

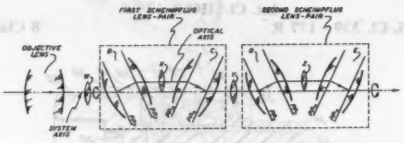
REVOLUTIONARY SCHEIMPFLUG VISUAL PROBE

Richard A. Mecklenborg, Binghamton, and Richard E. McClenahan, Johnson City, both of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed May 1, 1975, Ser. No. 573,623

Int. Cl.² G02B 27/00

U.S. Cl. 350—54 **7 Claims**



4. In an optical system, apparatus for achieving Scheimpflug correction of a tilted image using Scheimpflug relay lenses comprising:

a. at least one Scheimpflug relay lens pair located at fixed tilt angles with respect to the system axis of said optical system, said tilt angles being a function of relay lens design and the number of said Scheimpflug relay lenses employed; and

b. means to revolve said Scheimpflug relay lenses about said system axis while maintaining said fixed tilt angle, whereby the tilt of said image may be corrected.

3,985,423

OPTICAL DIGITAL TO ANALOG CONVERTER

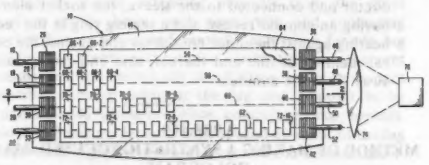
Samuel Chin-Chong Tseng, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1974, Ser. No. 537,722

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 WG **5 Claims**



1. A digital to analog converter for producing an analog optical output proportional to the summation of the weighted digital values of an encoded digital signal, comprising:

a plurality of thin-film optical waveguide segments, one for each element of the digital code, operative to convert light entered thereinto from a first to a second mode and to produce as an output therefrom of both said modes, the said segments being fabricated from a magneto-optic material;

magnetic field producing means coacting with each of said segments to produce in the magnetic waveguide material thereof a periodically reversing magnetic field, whereby said periodic field in said magneto-optic material converts a portion of one mode of light to a second mode as a function of the number of field reversals, the number of said means for producing the field reversals in each seg-

ment being proportional to the weighted digital value of the codal element associated with the segment;

means responsive to a digital code element input for rendering each said segment effective to convert the light from said first mode to said second mode, and

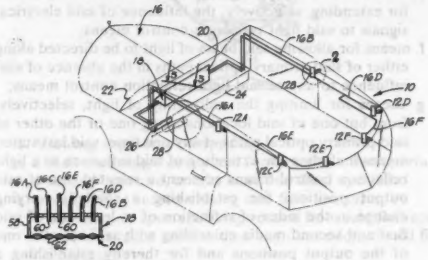
means for obtaining the summation of the second mode light outputs from all of said segments, whereby the summation manifests the analog of the digital inputs.

3,985,424

PANORAMIC REAR VIEWING SYSTEM

Ken Steinacher, Mahopac, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed June 18, 1975, Ser. No. 588,036
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 BC **1 Claim**



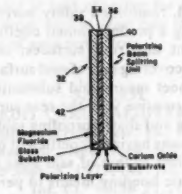
1. In an automatic vehicle, a panoramic rear viewing system comprising: plural fiber optic bundles having light input ends and light output ends; lockable swivel means mounting said light input ends on said vehicle at spaced apart locations for view in different generally rearwardly facing generally adjoining azimuthal sectors; said light output ends lying horizontally spaced apart in a horizontally elongated viewing area within said vehicle; and a transparent plate of varying thickness in front of said viewing area, the thickness of said plate being varied to form plural horizontally spaced apart magnifying lens means in register with said respective light output ends.

3,985,425

POLARIZING BEAM SPLITTING UNIT

Roy A. Clapp, 10522 Foley Blvd., Coon Rapids, Minn. 55433

Filed Aug. 18, 1975, Ser. No. 605,267
Int. Cl.² G02B 5/30, 27/14
U.S. Cl. 350—147 **7 Claims**



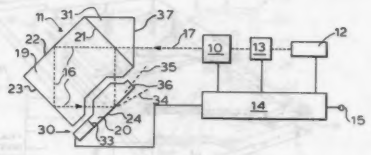
1. A polarizing beam splitting unit comprising a first transparent substrate having a reflection-enhancing coating on one surface thereof, a second transparent substrate having a reflection-reducing coating on one surface thereof, and a sheet of polarizing material between said substrates and secured to the other surfaces thereof.

3,985,426

LIGHT BEAM DEFLECTION RESOLUTION AMPLIFIER MEANS

Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif. 92041

Filed July 7, 1975, Ser. No. 593,874
Int. Cl.² G02B 5/23
U.S. Cl. 350—160 R **2 Claims**



1. A light beam position control system comprising:

a. a source of light and means for directing an individual beam of light therefrom along a primary optical path within said system so as to establish an availability of light of said beam at a plurality of predetermined locations along said path for a redirecting of said light from a selected one of said locations to, and along, a corresponding one of a plurality of secondary optical paths stemming, respectively, from said locations, each said location representative of an output position of said system;

b. said means including an array of at least three light reflecting interfaces of first and second light conducting media presenting, respectively, first and second indices of refraction and each interface presenting a length dimension, said array of interfaces each angularly oriented so as to establish an optical relationship one with respect to the other for allowing said beam of light to be directed along said primary path forming a helix of plural revolutions, each revolution including at least one of said predetermined locations representative of an output position at which light will be made available for said redirecting thereof along a corresponding secondary path, each said output position coinciding with, and extending along the length dimension of, at least one interface of said array of interfaces of first and second light conducting media;

c. a plurality of acoustic wave generator means;

d. a source of electrical signals for driving said acoustic wave generator means and control circuitry means for extending, selectively, the influence of said electrical signals to said generator means;

e. each said generator means operatively associated with said media of said one interface adjacent, respectively, each of said output positions;

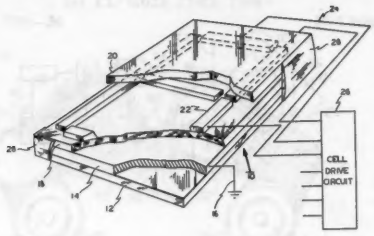
f. means for allowing said beam of light to be directed along said helix of plural revolutions in the absence of said influence to any of said plural generator means;

g. means for limiting the redirecting of light selectively from but one of said output positions at any one time, said last stated means including the extending of said influence to an acoustic wave generator means adjacent a selected one of said output positions for propagating an acoustic wave in at least one of said first and second media coinciding with said selected output position and for thereby establishing a diffraction grating in said one medium for effecting said redirecting of light along a secondary path stemming from said selected one of said output positions.

3,985,427
LIQUID CRYSTAL CELL AND METHOD FOR ITS MANUFACTURE

James Vincent Masi, Monroe, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 225,264, Feb. 10, 1972, Pat. No. 3,746,426, which is a continuation-in-part of Ser. No. 76,739, Sept. 30, 1970, abandoned. This application Mar. 29, 1973, Ser. No. 346,102
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC 9 Claims

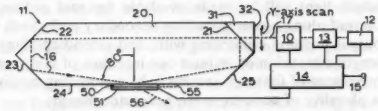


1. A liquid crystal cell comprising:
first and second flat substrates, said substrates being oriented parallel to each other;
means for impressing a potential difference of selected magnitude between at least selected portions of said substrates;
a strip of microglass paper comprised of submicron glass fibers impregnated with liquid crystal material sandwiched between said substrates, said liquid crystal material being retained in said microglass paper by capillary action; and
means for sealing the edges around said strip.

3,985,428
LIGHT OPTIC DATA HANDLING SYSTEM

Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif. 92041

Filed June 25, 1975, Ser. No. 590,105
Int. Cl.² G02B 5/23
U.S. Cl. 350—160 R 1 Claim

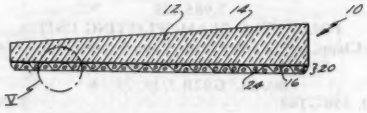


1. A light optic data handling system, comprising:
a. a source of light and means for directing an individual beam of light therefrom along, at least, first or second input paths to said system and thereupon along a corresponding one of first or second primary optical paths within said system so as to establish an availability of light of said beam at a plurality of predetermined locations along said primary optical paths for a redirecting of light from a selected one of said locations to, and along, a corresponding one of a plurality of secondary optical paths stemming, respectively, from said locations, each said location representative of an output position of said system;
b. said means including an array of at least three light reflecting surfaces each surface presenting a length dimension and each surface positioned substantially parallel one with respect to the other in said array, the surfaces of said array each angularly oriented so as to establish an optical relationship one with respect to the other for allowing said beam of light to be directed along either of said primary paths each forming a helix of plural revolutions, each revolution including at least one of said predetermined locations representative of an output position at which light will be made available for said redirecting thereof along a corresponding secondary path;
c. first and second light conducting media intimately adjacent to one another and thereby providing a light reflecting interface thereof, said interface extending along said length dimension and representative of at least one of the light reflecting surfaces of said array of surfaces, each of said output positions coinciding with, and extending along the length dimension of, said interface of the first and second light conducting media;
d. a plurality of light reflection control means each operatively associated with the media of said light reflecting interface along said length dimension thereof adjacent, respectively, said output positions;
e. a source of electrical signals and control circuitry means for extending, selectively, the influence of said electrical signals to said light reflection control means;
f. means for allowing said beam of light to be directed along either of said primary optical paths in the absence of said influence to any of said light reflection control means;
g. means for limiting the redirecting of light, selectively, from but one of said locations along one or the other of said primary optical paths at any one time, said last stated means including the extending of said influence to a light reflection control means adjacent a selected one of said output positions for establishing a spatially varying change in the index of refraction of at least one of said first and second media coinciding with said selected one of the output positions and for thereby establishing a diffraction grating in said medium for effecting said redirecting of light along a secondary path stemming from said selected one of said output positions.

3,985,429
STRENGTHENED, SHATTER-RESISTANT VEHICULAR MIRROR

Paul Fleischer, Holland, Mich., assignor to Donnelly Mirrors, Inc., Holland, Mich.

Filed Feb. 6, 1975, Ser. No. 547,725
Int. Cl.² G02B 5/08
U.S. Cl. 350—288 31 Claims



1. A strengthened, reinforced safety mirror comprisinng a sheet of glass having a predetermined coefficient of thermal expansion and front and rear surfaces; reflective coating means substantially covering one of said surfaces for reflecting light; reinforcing sheet means laid substantially against and being generally coextensive with the rear surface of said mirror for strengthening and shatterproofing said glass sheet, said reinforcing sheet means having a coefficient of thermal expansion generally matched to that of said glass sheet and means for allowing an elastic bonding means to permeate said sheet means and adhere said sheet means to said mirror; and resilient, elastic bonding means permeating said reinforcing sheet means and forming a layer including said reinforcing sheet means therewithin for adhering said reinforcing sheet means to said mirror whereby during exposure to normal temperatures or either extreme heat or cold, said reinforcing sheet means and said resilient, elastic bonding means together increase the tensile strength of said rear surface of said glass

sheet and retain any fragments and pieces of said glass should it be broken.

3,985,430

IMAGE VIEWING APPARATUS

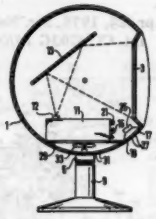
Siegfried Steiner, Munich, Germany, assignor to Steiner-Film Inh. Siegfried Steiner, Munich, Germany

Filed May 15, 1975, Ser. No. 577,756

Claims priority, application Germany, May 24, 1974, 74181105[U]

Int. Cl.² G03B *23/02, 21/16, 21/28*

U.S. Cl. 353—61 **9 Claims**



1. Viewing apparatus comprising:

a. a shell enclosing a cavity and formed with a first aperture, a second aperture, and at least one third aperture;

b. a translucent screen closing said first aperture,

1. said second aperture being spaced from said first aperture a distance smaller than any dimension of said first aperture;

c. a closure member mounted on said shell for movement toward and away from a position in which said member closes said second aperture,

1. said closure member being formed with perforations leading outward of said cavity in said position of said member;

d. an apertured support in said cavity,

1. said shell having an inner surface portion in said cavity formed with said at least one third aperture,

2. said inner surface portion and said support defining therebetween a chamber;

e. a cassette-loading projector mounted on said support,

1. said projector including an optical system for projecting an image from a cassette in said projector on the surface of said screen in said cavity,

2. said projector being formed with a loading port for insertion and removal of said cassette in a predetermined direction,

3. said second aperture being aligned with said port in said direction,

4. said projector having an apertured surface directed toward said at least one third aperture; and

f. a fan mounted in said chamber for directing a stream of cooling air from said at least one third aperture toward said surface of said projector.

3,985,431

CREDIT CARD VALIDATION AID

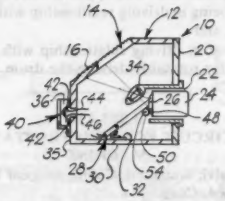
Robert D. Lindstrom, Bridgeview, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Sept. 8, 1975, Ser. No. 611,557

Int. Cl.² G03B *21/26*

U.S. Cl. 353—94 **2 Claims**

1. A viewing device for receiving driveable cartridges of film containing lists of invalid numbers for credit cards of different types comprising: a housing having a viewing screen formed of a plurality of side by side segments; a plurality of side by side projector means in said housing, each said projector means being configured for receiving a different associated one of said plural film cartridges and for projecting an image therefrom onto a different associated one of said screen segments, each said projector means including roller means for drivingly engaging the film in said associated cartridge and an associated lamp means for illuminating the film in said associated cartridge; a motor carried by said housing; a rotary shaft coupled to said motor for being driven therefrom, said shaft being directed proximate the roller means of each said projector means; plural electromagnetic clutch means carried by said shaft respectively proximate to and associated with each said roller means for selectively drivingly coupling said



shaft and said roller means in response to electrical energization of said associated clutch means; plural means carried by said housing respectively proximate a different associated one of said segments for respectively holding a credit card of a different type, each credit card type being associated with a different one of said projector means, plural switch means respectively proximate each said credit card holding means for detecting the presence of a credit card therein; each said switch means being coupled electrically in a circuit for energizing said clutch means and said lamp means of said associated projector means in response to the detection of the presence of said credit card in said holding means.

3,985,432

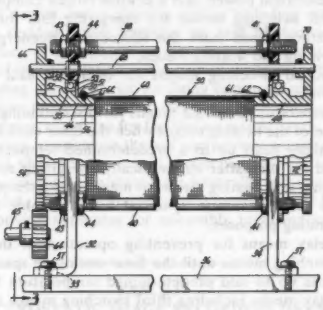
MODULATOR SCREEN DRUM ASSEMBLY

Shou L. Hou, Chagrin Falls, and Kenneth F. Taucher, Euclid, both of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed July 31, 1974, Ser. No. 493,219

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 R **10 Claims**



1. A drum assembly for rigidly supporting a modulator screen for aperture-controlled electrostatic printing, comprising:

a pair of end wall members axially positioned in spaced apart relationship, one of the end wall members being movable in an axial direction;

mounting means for rotatably supporting the end wall members;

a modulator screen formed into a cylindrical shape and secured at each end to the end wall members and extending longitudinally between the end wall members;

adjusting means associated with the mounting means for moving the end wall member to tension the modulator screen;

drive means associated with each of the end wall members for imparting rotational movement simultaneously to the drum, comprising:

a gear wheel associated with each of the end wall members;

a shaft rotatably supported within the mounting means;

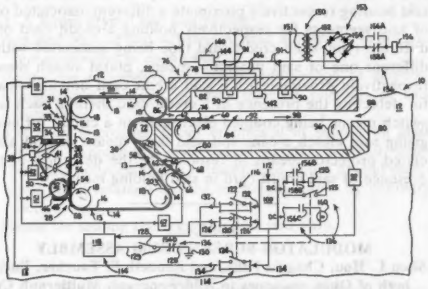
a pair of pinions fixed at opposite ends of the shaft, each pinion being in driving relationship with one of the gear wheels; and

a drive gear in driving relationship with one of the gear wheels for rotatably driving the drum.

3,985,433
CONTROL CIRCUIT FOR ELECTROSTATIC COPYING MACHINE

Salvatore J. Calvi, Stamford, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 22, 1974, Ser. No. 462,615
Int. Cl.² G03G *15/20*
U.S. Cl. 355—3 R **3 Claims**



1. An electrostatic copying machine comprising means for forming a developed image on a supporting substratum, a fuser including an enclosure defining a space within which the developed image is heatable for bonding to the substratum, means for heating the fuser enclosure space, a source of supply of electrical power, and a control circuit comprising:

a. first switching means for energizing said forming and heating means from the source and deenergizing said forming and heating means;

b. second switching means for operating said energized forming means;

c. temperature actuated means for discontinuing energization of the heating means when the fuser enclosure space initially heats up to a predetermined temperature level and for thereafter automatically energizing and deenergizing said heating means to maintain the temperature of the fuser enclosure space at levels suitable for image bonding purposes;

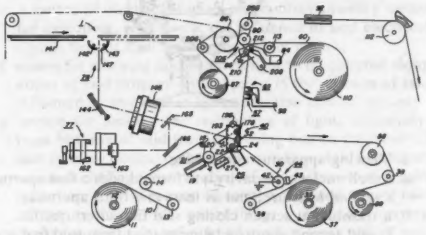
d. delay means for preventing operation of the second switching means until the fuser enclosure space initially heats up to said predetermined temperature level, said delay means including third switching means responsive to energization of the fuser for disabling operation of said second switching means until the fuser enclosure space initially heats up to said predetermined temperature level, thereby preventing operatioan of the energized forming means until the fuser space initially heats up to said predetermined temperature level; and

e. control means for disabling said delay means after said heating means has been initially energized and until said forming means has been thereafter deenergized, said control means including fourth switching means responsive to energization of said third switching means for disabling response of said third switching means to energization of the fuser after the fuser has been initially energized and until the forming means has been thereafter deenergized.

3,985,434
PHOTOELECTROPHORETIC PIGMENT DISCHARGING WITH A.C. COROTRON OR U.V. ILLUMINATION

Edwin A. Urbanek; Peter J. Warter, Jr., both of Penfield; Gino F. Squassoni, Pittsford; Vsevolod Tulagin, Rochester; Roger G. Teumer, Fairport, and Raymond K. Egnaczak, East Williamson, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 24, 1975, Ser. No. 571,350
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 P **14 Claims**



1. Photoelectrophoretic imaging apparatus comprising:

a. means for supporting a first transparent web electrode for travel;

b. first drive means cooperating with said means for supporting a first transparent web electrode to advance a first transparent web electrode through a predetermined path passing an ink coating means and an imaging station;

c. ink coating means for applying a thin film of photoelectrophoretic ink to the first transparent web electrode;

d. means for supporting a second web electrode for travel;

e. second drive means cooperating with said means for supporting a second web electrode to advance the second web electrode through a predetermined path passing the imaging station;

f. an imaging roller mounted at the imaging station, the second web electrode advanced into contact therewith; and whereat the ink carrying surface of the advancing first transparent web electrode is advanced by (a) and (b) in contact with the advancing second web electrode while it is contacting said imaging roller, thereby forming an ink-web sandwich and an imaging zone nip at said imaging roller, the two webs having ink sandwiched between them, supported at the imaging zone nip by said imaging roller on the second web electrode side of the sandwich without a support member contacting the imaging zone area on the first transparent web electrode side of the sandwich at the imaging zone nip;

g. means for coupling a voltage source to the imaging roller to establish an electric field across the ink-web sandwich at the imaging zone nip;

h. exposure means for projecting an image pattern of activating electromagnetic radiation through the first transparent web electrode onto the ink-web sandwich at said imaging roller;

i. means for separating the two webs from contact after the two webs have been advanced past the imaging station and said imaging roller to form an image pattern corresponding to the activating electromagnetic radiation on at least one of the webs; and

j. pigment discharging means mounted in the first transport web electrode travel path exiting the imaging station for

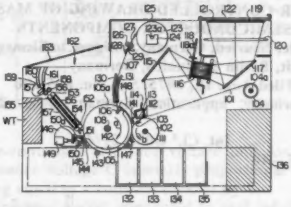
subjecting the formed image carried on the first transparent web electrode to an electric field.

3,985,435

COLOR ELECTROPHOTOGRAPHIC APPARATUS

Shigeru Suzuki; Nobuo Kasahara, both of Yokohama, and Nobuyuki Katagiri, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Division of Ser. No. 422,790, Dec. 7, 1973, abandoned. This application July 24, 1975, Ser. No. 598,727
Claims priority, application Japan, Dec. 29, 1972, 48-3733
Int. Cl.[2] G03G *15/01*
U.S. Cl. 355—4 7 Claims



1. A color electrophotographic apparatus comprising:

a. an electrophotographic photoreceptor movable in repeated reciprocatory movements between a first locality and a second locality,

b. means for urging said electrophotographic photoreceptor toward the first locality,

c. exposing means, including a plurality of color-selective reflection and transmission filters, for exposing said photoreceptor at the first locality to an optical image of an original to form an electrostatic latent image on said photoreceptor by using one of said color-selective reflection and transmission filters each time the photoreceptor makes one reciprocatory movement, said filters respectively corresponding to different colors for exposing the photoreceptor to different colors in succession as different filters are used in succession,

d. a transfer printing roller having a large diameter portion and a small diameter portion along its outer periphery and rotatable in one direction for successively traversing said second locality, a third locality, and a fourth locality during each cycle of rotation, said large diameter portion including means for mounting a transfer printing sheet thereon and being disposed to bring the sheet into intimate contact with said photoreceptor at the second locality when traversing said second locality,

e. means for interlocking the rotation of said roller to said photoreceptor while said large diameter portion of said roller is traversing said second locality, to move the photoreceptor toward the second locality at the same velocity as the peripheral velocity of said large diameter portion against the action of said urging means, thereby effecting transfer printing of an electrostatic latent image on the sheet from the photoreceptor,

f. developing means for developing the electrostatic latent image on the transfer printing sheet at said third locality into a visible image by using a developing agent of a color corresponding to the particular color-selective reflection and transmission filter used for exposing,

g. means for drying the developed image on the transfer printing sheet at the fourth locality, and

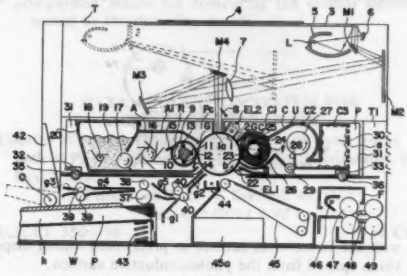
h. charging means for uniformly charging the photoreceptor upon completion of transfer printing during its return movement to said first locality caused by said urging means.

3,985,436

ELECTROPHOTOGRAPHIC COPYING APPARATUS

Susumu Tanaka, Sakai; Yuji Enoguchi, Osaka; Masaya Ogawa, Sakai; Hidetoshi Kawabata, Tondabayashi; Takaji Kurita, Kawachinagano; Takao Fujiwara, Sakai; Hiroshi Murasaki, Sakai, and Kenichi Wada, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed June 9, 1975, Ser. No. 584,892
Claims priority, application Japan, June 25, 1974, 49-73016; July 29, 1974, 49-90966
Int. Cl.[2] G03G *15/30*
U.S. Cl. 355—8 18 Claims



1. In an electrophotographic copying apparatus comprising a photoreceptor having a photoconductive outer surface which photoreceptor is rotatably disposed and movable along a path relative to a plurality of processing stations, such as a corona charging station provided with corona charging means for preliminarily charging said photoconductive outer layer of said photoreceptor, an exposure station including illuminating means for an original to be copied and an optical system for directing a light image of said original onto said preliminarily charged photoconductive surface of said photoreceptor so as to form an electrostatic latent image of said original on said photoconductive surface, a developing station including developing means for developing said latent image into a visible toner powder image, a transfer station including means for transferring said toner powder image onto a transfer material which is fed to said transfer station through a transfer material sheet feed device, and a cleaning station including means for removing residual toner particles on said photoconductive outer surface of said photoreceptor, and a fixing station following said transfer station in the path of the transfer material and including a fixing device for fixing said transferred visible toner powder image on said transfer material, an improvement of said copying apparatus for facilitating maintenance, repairs and replacing components thereof comprising: a unit casing in which said photoreceptor, said developing means and said residual toner removing means are integrally and operatively incorporated, and a receptable portion formed in said housing of said copying apparatus for releasably receiving said unit casing.

3,985,437

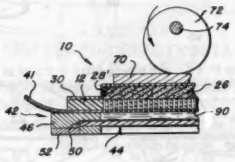
ELECTROSTATIC IMAGE RECORDING DEVICE HAVING PARTIALLY COLLAPSIBLE TONER APPLICATOR

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.

Division of Ser. No. 323,108, Jan. 12, 1973, Pat. No. 3,878,817. This application Jan. 27, 1975, Ser. No. 544,322
Int. Cl.[2] G03G *15/10*
U.S. Cl. 355—10 6 Claims

1. An electrostatic image recording device which comprises:

A. an optical projecting system for projecting images of that which it is desired to record,
B. charging means,
C. means for supporting an electrophotographic member having a photoconductive surface in charging relation to said charging means and in image receiving relation with said optical projecting system,
D. a container of toner in liquid suspension and having collapsible but recoverable side walls and a formanious rigid insulative top wall through which the suspension can be pumped,
E. means for moving the container and supporting means relative to one another after the photpconductive surface of an electrophotographic member on said supporting means has been charged and received a projected image



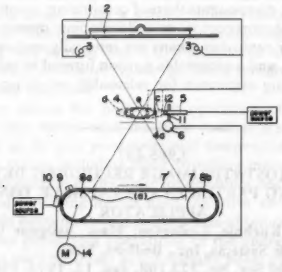
with the foraminous surface in juxtaposed toning disposition spaced from the photoconductive surface,
F. means on the exterior of the container operative to exert force upon said container at least temporarily collapsing said side walls to reduce the interior volume of said container and pump toner suspension from said interior out of said container while said foraminous surface is so disposed to tone the latent image on said photoconductive surface, and means for withdrawing into said container any excess suspension from the photoconductive surface also while said toning disposition is maintained, and
G. means on one of the electrophotographic member support and said top wall for confining the spread of suspension upon the photoconductive surface during application thereof and until withdrawal of excess is completed.

3,985,438

EXPOSURE CONTROL DEVICE

Takaji Kurita, Kawachinagano, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 27, 1975, Ser. No. 544,343
Claims priority, application Japan, Feb. 19, 1974, 49-20103
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—11 **16 Claims**



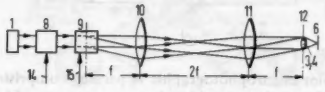
1. In an electrophotographic copying apparatus of the full frame exposure type the combination of a stationary transparent support member on which an original to be copied is placed, means for illuminating said original, an optical system including lens means for directing a light image from said original onto a photoreceptor moving at a constant rate driven by driving means, and means for exposing a full frame image of said stationary original onto a surface of said moving photoreceptor comprising means for intermittently flashing said illuminating means, means for moving said lens means for said optical system, at least during the duration of flashing time of said illuminating means, at a rate of one divided by the magnification of said lens means plus one times the moving rate of said photoreceptor, in the same direction as the moving direction of said photoreceptor, and means for synchronizing said movement of said lens means with said flashing time of said illuminating means.

3,985,439

DEVICE FOR THE LIGHT-OPTICAL, COMPUTER-CONTROLLED DRAWING OF MASKS FOR SEMICONDUCTOR COMPONENTS

Horst Kiemle, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 15, 1975, Ser. No. 605,190
Claims priority, application Germany, Aug. 29, 1974, 2441472
Int. Cl.[2] G03B *27/44*
U.S. Cl. 355—46 **4 Claims**



1. In a device for light-optical, computer-controlled drawing of masks for semiconductor components, said device comprising a source providing a coherent light beam, an electrically controllable light modulator means for modulating the beam of coherent light, a light deflector means having a plane for deflecting the beam of modulated coherent light and objective means including an objective lens arrangement for projecting the modulated beam of coherent light onto a layer of light sensitive material disposed on a plane of a carrier to form the mask pattern therein, the improvements comprising the projection means including a multiplier hologram disposed at the rear of the objective lens arrangement, said multiplier hologram splitting the focused light beam emerging from the objective lens arrangement into a plurality of sub-beams which are identical and extend in different directions, and additional optical lenses which are arranged between the light deflector means and objective means, said additional lenses focusing the plane of the light deflector means onto a plane of the objective means.

3,985,440

PROCESS AND APPARATUS FOR AUTOMATIC EXPOSURE TIME CONTROL IN COPYING DEVICES

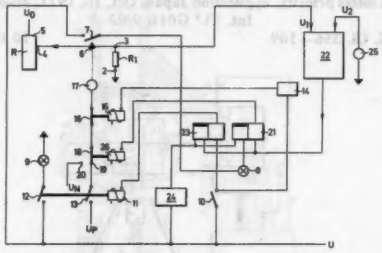
Werner Dennhardt, and Herbert Schröter, both of Taunusstein, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 336,386, Feb. 27, 1973, abandoned. This application Jan. 7, 1976, Ser. No. 647,237
Claims priority, application Germany, Mar. 1, 1972, 2209681
Int. Cl.[2] G03B *27/72*, *27/78*
U.S. Cl. 355—68 **7 Claims**

1. A process for automatic exposure time control in the exposure of light-sensitive copying material, comprising photoelectrically measuring the illumination in the plane of the copying material, generating during exposure a reference voltage U, which is inversely proportional to time T, U being equal to a constant divided by T, comparing said reference voltage during exposure with the voltage produced by the photoelectric measuring means, and terminating exposure

when a predetermined difference between the two voltages is reached.

5. An apparatus for automatic time control of a unit for the exposure of light-sensitive copying material with a copying light source; comprising, a photoelectric transducer for photoelectrically measuring the illumination in the plane of the copying material,



a time-controlled reference voltage unit for producing a reference voltage U inversely proportional to time T, U being equal to a constant divided by T,

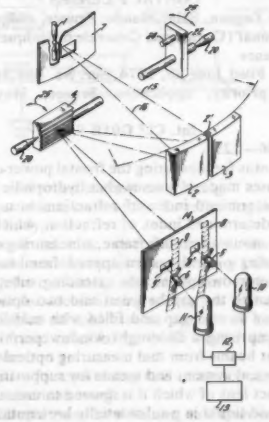
a comparator circuit connected to said reference voltage unit and said photoelectric transducer,

and switch means for turning off said copying light source when a predetermined voltage difference between the voltage of said reference voltage unit and said photoelectric transducer is reached.

3,985,441
MULTI-CHANNEL SPECTRAL ANALYZER FOR LIQUID CHROMATOGRAPHIC SEPARATIONS

Dietmar M. Schoeffel, and Armin K. Sonnenschein, both of Hillsdale, N.J., assignors to Schoeffel Instrument Corporation, Westwood, N.J.

Filed Mar. 13, 1974, Ser. No. 450,676
Int. Cl.² G01J 3/42
U.S. Cl. 356—88 **5 Claims**



1. A multi-channel analyzer for liquid chromatographic separations for comparing at least two liquids such as a reference and an unknown sample comprising:

a single light source;

an optical grating;

reflection means for directing a plurality of beams from the single light source to an identical area of the optical grating, the plurality of beams being spaced from one another such that the beams will establish identical spectra emanating from the identical area of the optical grating, the identical spectra being spaced from one another;

a plurality of spaced aperture means for permitting selected portions of the spectra to pass therethrough;

a plurality of containing means for containing the liquids being analyzed, there being an aperture means associated with each containing means;

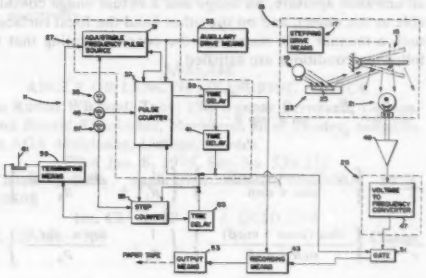
detecting means for separately detecting the light passing through each containing means of the plurality of containing means;

comparison means for comparing the several signals detected by the detecting means.

3,985,442
DATA ACQUISITION SYSTEM FOR SPECTROPHOTOMETER

Charles W. Smith, Ulster, and Mahlon D. Dyer, Sugar Run, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 7, 1974, Ser. No. 477,258
Int. Cl.² G01J 3/42
U.S. Cl. 356—96 **12 Claims**



1. A data acquisition system for a spectrophotometer including a monochromator means movable by a stepping drive means, said data acquisition system comprising:

a pulse source connected to said stepping drive means for providing pulses to said stepping drive means at a predetermined rate to move said monochromator means to a plurality of test positions;

a pulse counter means connected to said pulse source for counting said pulses provided by said pulse source to said stepping drive means, for sequentially disengaging said pulse source from said stepping drive means when a predetermined number of pulses representative of each of said test positions has been counted, and for providing a signal indicative of each of said disengagements;

clearing means connected to said pulses counter means for receiving said signal indicative of each of said disengagements and for clearing said pulse counter means in response to said signal;

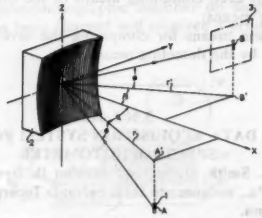
output means connected to said pulse counter means and to said spectrophotometer for receiving said signal from said pulse counter means and for providing sequential output signals indicative of the spectrophotometer output signals at each of said test positions in response to said signal from said pulse counter means.

3,985,443

METHOD OF OBTAINING STIGMATIC IMAGING IN SPECTRAL ANALYSIS USING A CONCAVE GRATING

Nils Allan Danielsson, Angsvagen 7, S-191 45 Sollentuna, Sweden, and Karl-Peter Christian Lindblom, Brinkasvagen 1, 21660 Nagu, Finland

Filed June 4, 1975, Ser. No. 583,674
Claims priority, application Finland, June 4, 1974, 1702/74
Int. Cl.² G01J 3/12
U.S. Cl. 356—99 4 Claims



1. A method of obtaining stigmatic imaging of an object on a focal suurface at wave-length dispersion of radiation using a concave grating, comprising placing on one hand the object, an entrance aperture, an image and a virtual image considerable as the object, and on the other hand the focal surface in such a manner with respect to the concave grating that the following conditions are satisfied

$$\tan^2\phi = \frac{R_2}{R_1} + \sin\alpha \cdot \sin\beta - 1$$

$$\frac{1}{r} = \left\{\frac{\sin\beta\,(\cos\alpha + \cos\beta)}{\sin\alpha + \sin\beta}\right\}\left\{\frac{1}{R_1} + \frac{\sin\alpha \cdot \sin\beta}{R_2}\right\}$$

$$\frac{1}{r'} = \left\{\frac{\sin\alpha\,(\cos\alpha + \cos\beta)}{\sin\alpha + \sin\beta}\right\}\left\{\frac{1}{R_1} \quad \frac{\sin\alpha \cdot \sin\beta}{R_2}\right\}$$

at a value for ϕ that differs from zero, in which formulae the various symbols denote the following quantities in an orthogonal three dimensional coordinate system the origo of which lies in the middle of the grating surface of the concave grating and where the X-axis runs along the normal to the grating surface and the Z-axis is parallel with the grooves of the grating:

ϕ = the angle between the XY-plane and a line from a selected point on the object to origo

α = the angle between the X-axis and a line connecting origo and the projection point in the XY-plane of said object point,

r = the distance between origo (O) and the projection point in the XY-plane of said object point,

β = the angle between origo and the projection point in the XY-plane of that point on the focal surface, which is hit by a ray emerging from said object point to origo after reflection through diffraction,

r' = the distance from origo to said projection point in the XY-plane of said point on the focal surface,

R_1 = the radius of curvature in origo of the curve of intersection between said grating surface and the XY-plane,

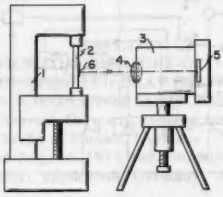
R_2 = the radius of curvature in origo of the curve of intersection between said grating surface and the XZ-plane, the angles α and β having the same sign if said object point and said point on the focal surface lie on the same side of the XZ-plane.

3,985,444

HIGHLY SENSITIVE PROCESS FOR MEASURING FINE DEFORMATION

Matsuo Takashima, Yokohama; Minoru Ohtsuka, Tokyo, and Kazuya Matsumoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 409,687, Oct. 26, 1973, abandoned, which is a continuation of Ser. No. 297,643, Oct. 16, 1972, abandoned. This application Sept. 19, 1974, Ser. No. 567,286
Claims priority, application Japan, Oct. 16, 1971, 46-81341
Int. Cl.² G01B 9/02
U.S. Cl. 356—109 10 Claims



1. A process for measuring fine deformation comprising the steps of:

deforming a test object having a periodic structure on its surface,

subjecting the periodic structure of the test object to illumination with incoherent light recording the deformed periodic structure on a recording medium to obtain a recorded object having a deformed periodic structural pattern,

illuminating said object recorded with incoherent light, with a coherent beam so as to obtain a plurality of diffracted beams,

directing two diffracted beams from among the plurality of diffracted beams onto an interference surface so as to form an interference fringe pattern, and

detecting the deformation of the test object on the basis of the interference fringe pattern.

3,985,445

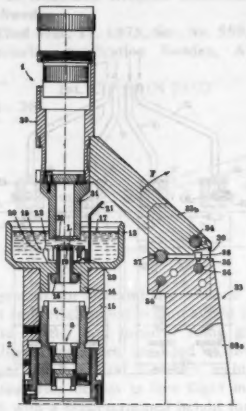
APPARATUS FOR MEASURING FRONTAL POWER OF CONTACT LENSES

Luc André Tagnon, Saint Mande, France, assignor to Essilor International (Compagnie Generale d'Optique), Joinville Le Pont, France

Filed June 28, 1974, Ser. No. 484,347
Claims priority, application France, May 30, 1974, 74.18802
Int. Cl.² G01B 9/00
U.S. Cl. 356—125 1 Claim

1. Apparatus for measuring the frontal power of soft corneal contact lenses made of a somewhat hydrophilic material having a predetermined index of refraction, in a liquid having itself a predetermined index of refraction, which comprises a frame and, mounted on this frame, a measuring optical system and a sighting optical system spaced from each other and having a common optical axis extending substantially vertically at least in the gap between said two optical systems, a cup disposed in said gap and filled with said liquid, the cup bottom comprising a fluid-tight window permitting the passage of light beams from said measuring optical system to said sighting optical system, and means for supporting and centering a contact lens of which it is desired to measure the frontal power in said liquid in a substantially horizontal position with the optical axis of the contact lens merging into the vertical optical axis of the apparatus, said sighting optical system extending vertically, and being movably mounted on said frame so that it can selectively be brought to an operative position with its lower end immersed into the liquid contained

in said cup and to a clear position away from said cup, to permit the positioning and removal, respectively, of the sup-



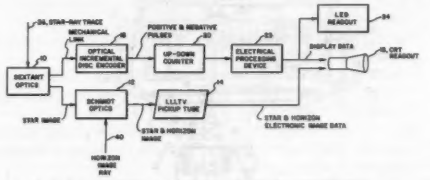
porting and centering means with the contact lens to be measured.

3,985,446

REMOTE CONTROLLED, CRT DIGITAL DISPLAY, LLLTV CAMERA-SEXTANT

Sidney Feldman, Silver Spring, Md., and George G. Barton, Harkers Island, N.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 27, 1974, Ser. No. 500,987
Int. Cl.² G01C *1/00*; G02B *27/32*
U.S. Cl. 356—144 11 Claims



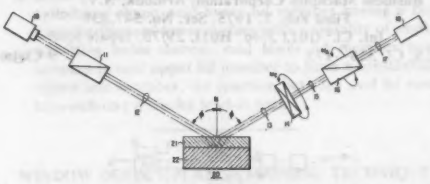
1. A remote controlled sextant comprising:
remotely adjustable sextant optics for reflecting an image of a celestial body;
optical incremental disc encoder means mechanically linked to said sextant optics for producing pulses indicative of angular movement of said sextant optics;
counter means for accumulating said pulses to indicate said angular position of said sextant optics and thereby the elevation of said celestial body for digital display on a display device;
additional optics for combining said image of said celestial body with a horizon image;
electronic pickup means for detecting said combined image of said horizon and said celestial body and converting it into an electronic signal for display on said display device;
wherein the elevation of said celestial body is displayed on said digital display device when said remotely adjustable sextant optics are adjusted so that said celestial body is aligned with said horizon on said display device.

3,985,447

MEASUREMENT OF THIN FILMS BY POLARIZED LIGHT

David Erik Aspnes, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 29, 1975, Ser. No. 609,037
Int. Cl.² G01N *21/40*
U.S. Cl. 356—118 13 Claims



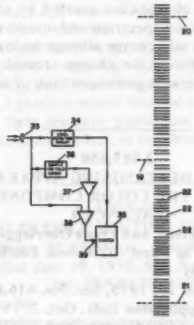
1. A method of testing a thin film-substrate system which comprises the steps of
a. directing an incident beam of substantially monochromatic polarized optical radiation onto an exposed surface of the thin film, and
b. detecting the resulting reflected beam of radiation reflected from the surface and transmitted through a rotating optical compensator and a rotating optical analyzer, the compensator and analyzer rotating about an axis along the propagation direction of the reflected beam at different first and second different angular speeds, respectively.

3,985,448

ANGLE OR LENGTH MEASURING DEVICE

Klas Rudolf Wiklund, Taby; Nils Gunnar Bernhard, Lidingo, and Harald Kleinhuber, Mariefred, all of Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden

Filed Jan. 8, 1975, Ser. No. 539,321
Claims priority, application Sweden, Jan. 15, 1974, 7400508
Int. Cl.² G01B *11/14*; G01D *5/36*
U.S. Cl. 356—169 5 Claims



1. A measuring device including:
a measuring plate mounted for movement past a point having a measuring scale thereon, said scale being comprised of a regular optical pattern and a first irregular optical pattern;
a photo-detector mounted at said point for detecting light from said measuring scale to provide an electric signal;
first means responsive to said electric signal for providing a reference signal in response to said electric signal resulting from said first irregular optical pattern; and

second means responsive to said electric signal for providing a measuring signal in response to said electric signal resulting from said regular optical pattern.

3,985,449

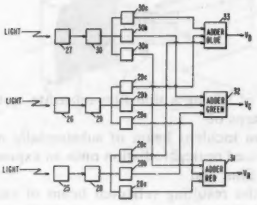
SEMICONDUCTOR COLOR DETECTOR

Nicholas Alex Patrin, Shelburne, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 7, 1975, Ser. No. 547,839

Int. Cl.² G01J *3/46;* **H01L** *29/78;* **H04N** *9/06*

U.S. Cl. 356—173 **9 Claims**



1. A semiconductor light sensitive scanner comprising:

a body of semiconductor material having a substantially planar surface and containing a region of a first conductivity type and a region of a second conductivity type with a P-N junction defined in said body between said regions,

an insulating layer of said surface,

a plurality of conductive electrodes disposed on said layer,

means for biasing each of said regions and at least a first one of said electrodes at predetermined voltage values to establish between said one of said electrodes and said P-N junction a depletion region having therein a maximum electron potential energy location positioned a given distance from said surface,

the portion of said depletion region lying between said surface and said location comprising a charge storage region wherein charges are created by electromagnetic radiation of a given spectrum and stored therein, and

means coupled to said charge storage region for providing a signal indicative of the charge created in said charge storage region by said given spectrum of electromagnetic radiation.

3,985,450

COLOR FILTER DETERMINING APPARATUS WITH INDICATION OF THE COLOR COMPONENTS TO BE BALANCED

Siegfried Barbieri, Brixen, and Franz Obertegger, Meran, both of Italy, assignors to Durst AG Fabrik Fototechnischer Apparate, Bozen, Italy

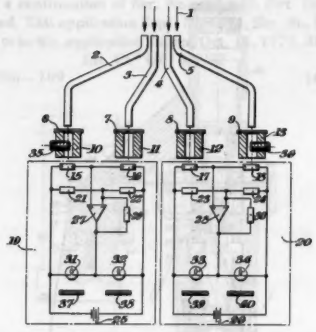
Filed Sept. 23, 1975, Ser. No. 616,084

Claims priority, application Italy, Oct. 2, 1974, 4903/74

Int. Cl.² G01J *3/46;* **G01B** *27/78*

U.S. Cl. 356—175 **10 Claims**

1. A color filter-determining apparatus for photographic printing light, which indicates the color components to be equalized, comprising two separate measuring circuits, at least two photoelectric transducers in each measuring circuit, at least one of the transducers in each measuring circuit being sensitive to the same primary color, light-channeling means disposed between the printing light and the transducers for directing the printing light upon the transducers, each measuring circuit contains a light balance with two visual indicating means, one of the two visual indicating means in each measuring circuit is correlated with the one each of the photoelectric transducers sensitive to the same primary color whereby independent adjustment of the color balance affected by each measuring circuit is afforded.



3,985,451

METHOD OF MEASURING THE PITCH ANGLE OF YARNS PROVIDED WITH A TWIST

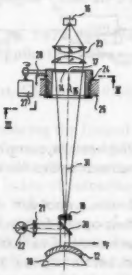
Johann Plöckl, Unterhaching, Germany, assignor to Erwin Sick Optik-Elektronik, Waldkirch, Germany

Filed Aug. 20, 1975, Ser. No. 606,242

Claims priority, application Germany, Sept. 12, 1974, 2443692

Int. Cl.² G01B *11/26*

U.S. Cl. 356—199 **15 Claims**



1. Method of measuring the pitch angle of thread provided with a twist, wherein an image of the surface of the thread is cast onto a slitted shutter, the slitted shutter and the thread are rotatable relatively to each other about their connecting axis and the intensity of the light passing through the slitted shutter is measured as a function of the relative angle of rotation between thread and slitted shutter.

3,985,452

ARRANGEMENT FOR DETERMINING VISIBILITY IN THE GLIDE PATH OF AN AIRCRAFT

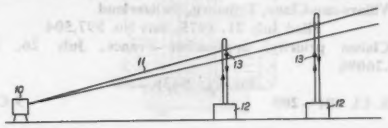
Magnus Bylander, and Bernt Ling, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 17, 1975, Ser. No. 559,051

Claims priority, application Sweden, Apr. 30, 1974, 7405782

Int. Cl.² G01N 21/22

U.S. Cl. 356—201 **5 Claims**



1. Arrangement for determining oblique visibility, comprises a light emitter arranged to emit a light beam and a light receiver, said emitter and receiver being ground-mounted, and a plurality of members, arranged at different distances from the light receiver, said members including means for launching measuring bodies in free flight in a substantially vertical path with a predetermined height for each member, each measuring body including means to reflect the light emitted from the light emitter against the light receiver if the visibility is sufficient.

3,985,453

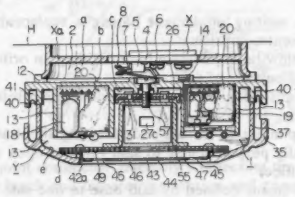
LIGHT SCATTERING TYPE SMOKE DETECTOR

Takeshi Nakano; Kunisige Kurata, both of Owari-Asahi; Yoshihiko Okuda, Izumi, and Tsunehiko Araki, Takarazuka, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed July 19, 1974, Ser. No. 489,881

Int. Cl.² G01N 21/12

U.S. Cl. 356—207 **7 Claims**



1. A light-scattering smoke detector comprising:

a mounting base having a substantially planar upper surface and means to facilitate mounting said base to a room ceiling surface;

an optical system comprising a horizontally disposed base plate, a light emitting element depending from one longitudinal end of said base plate, a light receiving element depending from the other longitudinal end of said base plate and a light shielding means consisting of a plurality of elements depending from said base plate and disposed between said light emitting element and said light receiving element;

an upper lid member substantially of a vertically disposed cylindrical shape closed at its upper end, said upper lid being provided with means for coupling the same with said mounting base, said upper lid member having a pair of chambers depending therefrom at horizontally symmetrical positions with respect to a diametrical plane through said lid member, said pair of chambers being spaced from one another and formed integrally with said lid member, an electric source part housed in one of said chambers and electrically connected with the light emitting element, and an amplifying part housed in the other one of said chambers and electrically connected with the light receiving element, said base plate being mounted to said upper lid member between said pair of chambers with said light emitting element, said light receiving element, and said light shielding means oriented along said diametrical plane; and,

a lower lid member substantially of a vertically disposed cylindrical shape, said lower lid member having a horizontally disposed lower surface with a plurality of smoke-admitting holes therein, said lower lid member being coupled to said upper lid member to form a substantially cylindrical chamber, the junction between said lid members defining a smoke lead-in path.

3,985,454

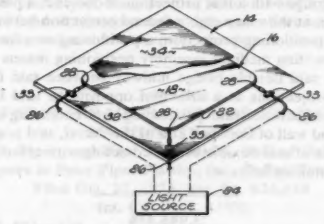
WINDOW DEFECT PLANAR MAPPING TECHNIQUE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Fred R. Minton, Lakewood, and Uel O. Graham, Upland, both of Calif.

Filed Mar. 14, 1975, Ser. No. 558,600

Int. Cl.² G01N 21/16, 21/32

U.S. Cl. 356—237 **4 Claims**



1. A method of planar mapping a sheet of transparent material having an edge surface and a planar surface, for detecting defects in the sheet of transparent material and said planar surface, said method comprising the steps of:

a. mounting said transparent sheet on a support surface;

b. positioning a light source adjacent the edge of said sheet of transparent material;

c. placing a light sensitive paper adjacent said planar surface in superposed contacting relationship therewith; and

d. illuminating said transparent material by said source of light for a predetermined interval of time thereby exposing said light sensitive paper and producing thereon a map of flaws and defects in the sheet of transparent material.

3,985,455

CONVERTIBLE WRITING INSTRUMENT

Eric C. Wahlberg, 32 Eighth St., Stamford, Conn. 06905

Filed Jan. 10, 1975, Ser. No. 539,959

Int. Cl.² B43K 27/14

U.S. Cl. 401—30 **5 Claims**

1. A convertible writing instrument comprising a first writing instrument including a first barrel having an aperture in a tapered end and a coupling means in the opening of the other end, a second barrel having an aperture in a tapered end, and a coupling means compatible with said coupling means of said first barrel in the opening of the other end, said first and second barrels being united by engagement of said coupling means of said first and second barrels, at least one writing medium assembly positioned in said first barrel, at least one writing medium assembly positioned in said second barrel, a writing medium assembly positioning means of said first writ-

ing instrument located in said opening of the first barrel and co-acting with said writing medium assembly of said first writing instrument to position said retractable and replaceable writing medium assembly in writing position through said aperture or in the retracted position in said first barrel, said first barrel further including positioning holes, a writing medium assembly positioning means positioned in said first barrel co-acting with said writing medium assembly in said first barrel, said writing medium assembly positioning including a

flexible bridge with a first projection at one end, a positioning projection at the other end, a second projection between said first and positioning projection, a positioning arm for actuating said writing medium assembly positioning means extending from said flexible bridge midway between said first and second projections in a direction opposite to said first and second projections, said positioning arm extending out of a slot in said wall of the open end of the barrel, said positioning projection of said flexible bridge co-acting with at least one of said positioning holes.

3,985,456

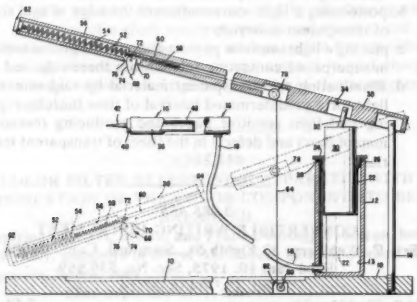
CALLIGRAPHIC DEVICE FOR ARTISTS OR THE LIKE

Angus Lumsden, 25 Waverly St., Glen Head, N.Y. 11545

Filed Apr. 7, 1975, Ser. No. 565,809

Int. Cl.² B43K *5/04*

U.S. Cl. 401—145 **6 Claims**



1. A calligraphic device comprising nozzle means for depositing a lineament on a surface including fluid pressure responsive means for feeding a viscose medium through said nozzle means, operator influenced manually operable fluid pressure means disposed apart from said nozzle means for providing an operator controlled fluid pressure to said fluid responsive means such that the lineament can be deposited remote from the provision of the fluid pressure means, said fluid pressure means including a cylinder sealed at one end thereof and open at its other end, a piston disposed within said cylinder, a flexible diaphragm disposed within said cylinder intermediate of said cylinder and said piston and in removeable sealing engagement at the open end of said cylinder and means at said closed end of said cylinder and intermediate of said flexible diaphragm and the inner wall of said cylinder for supplying fluid pressure from said fluid pressure means to said nozzle means.

3,985,457

WRITING IMPLEMENT HAVING A REPLACEABLE REFILL

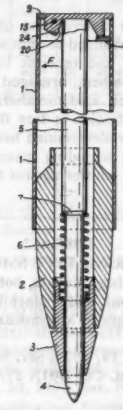
Jean-Marie Paroty, Ableiges, France, assignor to Interlight, Villars-sur-Glane, Fribourg, Switzerland

Filed July 21, 1975, Ser. No. 597,504

Claims priority, application France, July 26, 1974, 74.26096

Int. Cl.² B43K *7/00*

U.S. Cl. 401—209 **9 Claims**



1. A writing implement having a replaceable refill, said instrument comprising:

a hollow body having a base defining an orifice therein for the passage of said refill,

resilient means in said body baissing said refill toward said base,

a flap mounted on said body to swing about an axis substantially perpendicular to said refill to open and close said orifice,

stop means defined by said base to one side of said orifice and so positioned that said refill can be gripped between said stop and said resilient means

a ramp carried by said flap at the side thereof remote from said axis and positioned to force said refill beneath said stop as said flap is closed, and

a projection carried by said flap at a point closer to said axis than said ramp and positioned to force said refill away from said stop into alignment with said orifice as said flap is opened.

3,985,458

LOCKING DEVICE

Alan H. Snyder, Jr., Dallas, Tex., assignor to Roberts Industries, Inc., Salina, Kans.

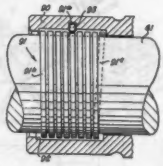
Division of Ser. No. 248,573, April 28, 1972, Pat. No. 3,880,483. This application Apr. 21, 1975, Ser. No. 569,845

Int. Cl.² F16C *11/00*; F16D *1/12*, *3/00*

U.S. Cl. 403—111 **8 Claims**

1. A locking system for coupling two concentric relatively moveable members together responsive to a force applied to one of said members comprising: a first member; a second

member concentrically disposed about said first member, said second member having an internal recess extending about said first member and a slot opening into said internal recess; and a locking part biased to frictional engagement with said first member comprising a coil spring wound about said first member and having a tang portion in the form of a central kink



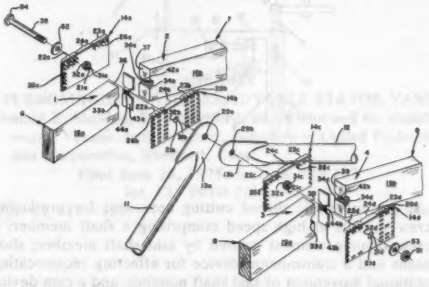
disposed in said slot in said second member for engaging said second member and a plurality of coils on each side of said central kink, the coils on one side gripping said first member responsive to a first direction of rotation of one of said members and the coils on the other side gripping said first member responsive to rotation of said one of said members in an opposite direction.

3,985,459

TRUSS RIDGE-JOINT CONNECTOR ASSEMBLY

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Mar. 29, 1976, Ser. No. 671,375
Int. Cl.² E04C 3/292
U.S. Cl. 403—217 **4 Claims**



1. A ridge-joint connector assembly connecting the ends of abutting top chords and transferring tension and compression loads between said chord members and metal web members in a truss structure wherein said top chords consist of two juxtaposed pitched and parallel lumber members, and said metal web members have flattened end areas interposed between said lumber members comprising:

a. Two pairs of continuous sheet metal fastener plates positioned on the inside and outside faces of the ends of said lumber members and each plate includes an opening therethrough and a fastener area on both sides of said opening and disposed from said opening leaving an area around said opening free of fasteners;

b. a plurality of sharp pointed fastener means sufficient in number to transfer substantially all of the web load to said lumber members and having a length less than the width of said lumber member and connecting said fastener area of said plates to said chord by penetrating the inside and outside faces of said lumber members at a plurality of closely spaced intervals in order to reduce the possibility of failure of said lumber by splitting;

c. the flattened ends of said metal web members are formed with openings therethrough;

d. each of said openings in said plates is surrounded by integrally formed drawn sidewalls extending into said lumber members forming a coaxial annular flange providing bearing area;

e. there being enlarged counter sunk openings in the inside and outside faces of said lumber members dimensioned to receive said annular flanges of said plates in a force fit;

f. a cylindrical elongated metal load transfer member having a diameter and a length dimensioned to transfer loads between said metal fastener plates and said metal web members by bearing against a substantial portion of said metal plate flanges in a force fit, and against the edges of said openings in said metal web members;

g. the abutting end faces of said lumber members are formed with hemispherical grooves for receiving said load transfer member;

h. means providing lateral support for holding the members of said assembly together;

i. a pair of ridge-end metal butt-inserts each covering a substantial portion of the end of one of said abutting lumber members and spaced therebetween, and said butt-inserts have a hemispherical offset formed therein dimensioned for receipt in said hemispherical groove in one of said abutting lumber members; and

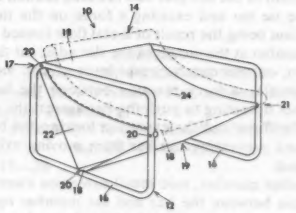
j. said web members, plates, fastener means and load transfer member are positioned so that substantially all load transference from said web members to said wood chord members occurs at the interface of said plates and the inside and outside faces of said lumber members through said plurality of sharp pointed fasteners and a portion of said load is transferred through said offset in said butt-inserts and said load transfer member.

3,985,460

FRAME SEAT AND MECHANISM FOR JOINING FRAME PORTIONS THEREOF

Peter D. Piper, and Kent W. Bouldin, both of Dallas, Tex., assignors to Peter Piper Plastics, Inc., Dallas, Tex.

Filed Oct. 22, 1975, Ser. No. 624,644
Int. Cl.² F16L 41/00
U.S. Cl. 403—234 **10 Claims**

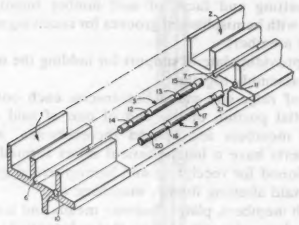


1. A connector for transversely joining first and second hollow tubular members, the connector comprising: a first extension having an outer surface conforming generally to the inner surface of said first member for extending axially thereinto, said first extension further having a frusto-conical recess formed therein and means in the outer surface of said first extension to permit expansion thereof; plug means having a frusto-conical outer surface conforming generally to the interior surface of said first extension; a second extension integral with said first extension but oppositely facing, said second extension having an outer end portion with a contoured surface adapted to abut in full contact with said second member and having an outer surface smaller than the inner surface of the second member and capable of extending transversely thereinto; and biasing means for simultaneously locking said second member to said connector and urging said plug means to maintain said first extension in expansive engagement with said first member.

3,985,461
BUTT JOINTS

Paul C. Gebhard, Little Falls, N.J., assignor to Young Windows Inc., Conshohocken, Pa.

Filed May 8, 1973, Ser. No. 358,284
Int. Cl.² F16B 7/00
U.S. Cl. 403—292 2 Claims



1. A joint structure for fastening two abutting members of a window assembly comprising:

a pair of linearly extending metal members disposed in abutting relationship;

a pair of aligned, linearly extending slots respectively formed in said members with the mouth of each slot being on the surface of its member;

an elongated linearly extending tie bar disposed in said slots and extending across the butt joint, the open slot making the bar accessible from the surfaces;

a pair of axially spaced, reduced sections on the tie bar respectively disposed in said slots on opposite sides of said butt joint;

on each member, a section of metal thereof extending from the mouth of the slot into said reduced section and engaging the tie bar and exerting a force on the tie bar, said extention being the result of metal flow caused by staking the member at the mouth of the slot adjacent the reduced section; on one member, said force of said metal extension causing a force reaction between the bar and the member operating to push the bar against the wall of the slot, the force and the extension locking the bar in position and preventing the bar from moving axially in the slot; and

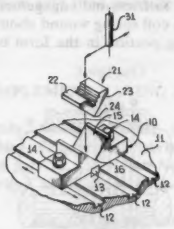
on the other member, said metal extension causing a force reaction between the bar and the member operating to push the bar against the wall of the slot and also operating to push the other member tightly against said one member so that the members tightly engage at the butt joint, the force and the extension locking the bar in position and preventing the bar from moving axially in the slot.

3,985,462
V-BLOCK CENTER FINDER

Thomas P. Didato, 32 Washington Ave., Middlesex, N.J. 08846

Filed June 27, 1975, Ser. No. 590,873
Int. Cl.² B23B 49/00
U.S. Cl. 408—72 R 6 Claims

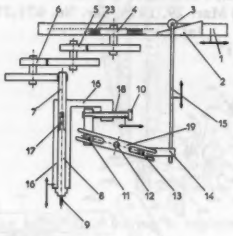
1. A center finder for use with a V-block support for an article to be machined, said center finder comprising an elongated block of a transverse V outline for seating in matched relation in a V-shaped seat of a V-block article support, said center finder block having a lower apex extending in a longitudinal vertical plane, said plane bisecting the angle included by the V outline, and said center finder block having formed in an upper part thereof at least one longitudinally extending centering groove centered relative to said vertical plane for receiving a tool to effect centering of the tool relative to the V-block.



3,985,463
AUTOMATIC THREAD CUTTING DEVICE

Eugene A. Hallal, 94, rue des Rosiers, 93400 Saint-Ouen, France

Filed Mar. 10, 1975, Ser. No. 556,730
Int. Cl.² B23B 49/04, 47/26
U.S. Cl. 408—116 6 Claims



1. An automatic thread cutting apparatus for producing screw threads at high speed comprising a shaft member; a screw tapping element carried by said shaft member; slide means and a transmission device for effecting reciprocating rotational movement of said shaft member; and a cam device associated with said slide means for effecting feed and recoil movements of the shaft member corresponding to rotational movement of the shaft member; said cam device including adjustment means for adjusting the pitch of the screw tapping element, said cam device synchronising the rate of rotation of said shaft member with the feed and recoil movements thereof, whereby the rate of rotation of the tapping element may be varied, the feed and recoil movement of the tapping element being directly proportional to the rate of rotation thereof.

3,985,464
SPINNING RESERVE DEVICE FOR A WATER-WHEEL

Takeo Hachiya, and Keiichi Hagiya, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 25, 1974, Ser. No. 509,265
Claims priority, application Japan, Sept. 26, 1973, 48-107470
Int. Cl.² F01D 1/06
U.S. Cl. 415—1 6 Claims

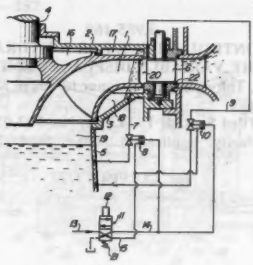
1. A spinning reserve device for a water-wheel comprising:

a runner of the Francis type;

an upper cover in spaced juxtaposed relationship with an upper surface of the runner;

a lower cover in spaced juxtaposed relationship with an underside of the runner;

a plurality of pivoted guide vanes arranged on the outer periphery of said runner for the entire circumferential extent and in the closed position to define an annular chamber between the guide vanes and said runner;



a plurality of leak drain pipes opening in the upper cover interposed between the outer periphery of said runner and said guide vanes defining said chamber;

a plurality of leak drain valves each mounted in one of said leak drain pipes; and

means for suitably operating said leak drain valves to drain water under pressure from the chamber defined between the outer periphery of the runner and the guide vanes during spinning reserve operation.

3,985,465

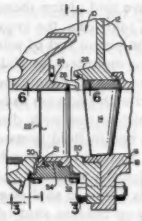
TURBOMACHINE WITH REMOVABLE STATOR VANE

Donald E. Sheldon, East Hartford, and Richmond G. Shuttleworth, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 25, 1975, Ser. No. 590,207

Int. Cl.² F01D *5/26, 9/00*

U.S. Cl. 415—189 **4 Claims**



1. In an axial flow turbomachine, the combination comprising:

a rotor including at least one annular array of rotor blades, and

a stator,

said stator including an annular case having a first axial portion surrounding said array of rotor blades and a second axial portion immediately adjacent said first axial portion,

an annular array of stator vanes surrounded by said second axial portion of said casing,

said second axial case portion having an access hole passing radially therethrough at one location along its circumference,

a plug movable radially into and out of said hole from the outside of said case,

means removably fixing said plug to said case with said plug positioned in said hole,

means attaching a majority of said stator vanes directly to said second axial case portion,

means attaching the remainder of said vanes to said plug so that when said plug is removed from said case said remainder of said vanes are removed with it to permit access to said rotor,

said rotor including a disc to which said annular array of rotor blades is attached,

said disc having an annular portion extending axially toward said annular array of stator vanes and having a radially outwardly opening groove formed therein for receiving balance weights,

said stator including an inner annular shroud surrounded by the radially inner ends of said annular array of stator vanes,

said balance weight groove of said disc being located generally radially inwardly of said shroud, and

said shroud having a recess therein generally aligned with said access hole to permit a tool to be inserted into said hole and through said shroud recess to said balance weight groove.

3,985,466

Patent Not Issued For This Number

3,985,467

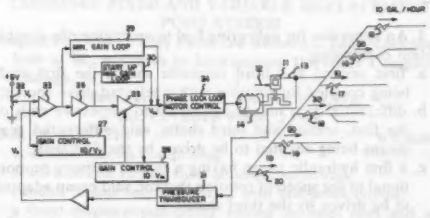
CONSTANT PRESSURE PUMP

Peter Lefferson, St. Petersburg, Fla., assignor to Milton Roy Company, St. Petersburg, Fla.

Filed May 27, 1975, Ser. No. 580,770

Int. Cl.² F04B *49/06*

U.S. Cl. 417—20 **7 Claims**



1. A control system for maintaining a constant desired fluid pressure in a fluid load driven by a variable flow fluid pump having a variable speed motor comprising:

means for generating a set point signal representing said desired pressure;

a pressure transducer responsive to said fluid load for generating an actual pressure signal;

an error amplifier, said set point signal and said actual pressure signal being applied to said error amplifier to produce an error signal;

a variable gain amplifier stage including first and second variable gain amplifiers, said error signal being applied to said variable gain stage, the output of said variable gain stage being applied to control the speed of said motor, a signal proportional to pressure being applied to said first amplifier to change the gain thereof in inverse proportion to said pressure; and

means for generating a signal representing fluid flow in said load, said signal representing flow being applied to said second variable gain amplifier to control the gain thereof in proportion to said flow so that the gain of said amplifier stage is controlled in inverse proportion to the variable restriction of said fluid flow.

3,985,468

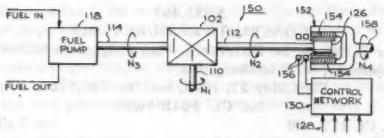
GAS TURBINE FUEL DELIVERY SYSTEM

Leon David Lewis, Rancho Palos Verdes, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 24, 1974, Ser. No. 536,144

Int. Cl.² F04B *49/00*; F16H *37/06*

U.S. Cl. 417—214 **7 Claims**



1. An apparatus for delivering fuel to an engine, the combination comprising:

a. first, second and third rotatable shafts, the first shaft being coupled for rotation with a selected drive source;

b. differential gear means connected to respective ends of the first, second and third shafts, said differential gear means being adapted to be driven by the first shaft;

c. a first hydraulic pump having a rate of delivery proportional to the speed of rotation thereof, said pump adapted to be driven by the third shaft;

d. driving means coupled to the second shaft selectively for accelerating and for braking the rotational speed of the second shaft, said driving means including a fourth shaft drivable at a selected speed and being coupled to the second shaft by an eddy current coupler; and

e. electrical control means for varying the degree of coupling in the eddy current coupler between the second shaft and fourth shaft, said electrical control means having at least one electrical signal input capability, whereby the differential gear means modulates the speed of the third shaft so as to vary the rate of fuel delivery from the pump.

3,985,469

OUTPUT CONTROL DEVICE FOR A HYDRAULIC PUMP OF THE VARIABLE DISPLACEMENT TYPE

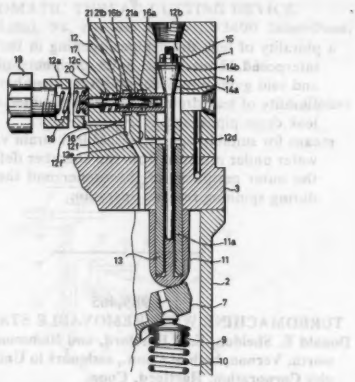
Mitsuo Ohta, Tokyo, Japan, assignor to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed Sept. 4, 1974, Ser. No. 503,075

Claims priority, application Japan, Sept. 20, 1973, 48-105476

Int. Cl.² F04B *1/22*

U.S. Cl. 417—222 **10 Claims**



1. In an output control device for a hydraulic pump of the variable displacement type including a cylinder having a control piston and a piston rod reciprocally movable therein, a yoke arranged to vary the delivery of said pump by change in the inclination of said yoke in response to movement of said piston, and means for feeding a delivery pressure of said pump into said cylinder to move said piston thereby to effect variation in the inclination of said yoke, the improvement comprising a cam formed on the piston rod of said control piston, a hollow cylindrical sleeve mounted for slidable movement in directions perpendicular to said piston rod and arranged to remain in sliding contact with said cam to be displaced by said cam away from said piston rod with displacement of said control piston due to a rise in fluid pressure, a fluid passage leading to said cylinder, a pressure pickup hole defined in said sleeve in flow communication with said fluid passage, a compensation piston slidably fitted in said sleeve and adapted to close said pressure pickup hole to shut off flow of pressure fluid into said cylinder when the fluid pressure is zero and to be moved upon a rise of fluid pressure away from said pickup hole to open said pickup hole, a compensation piston fluid passage extending from one end of said compensation piston facing said piston rod to the cylinder hole in order to effect balancing of the forces applied to both ends of said sleeve by the fluid pressure exerted in said compensation piston fluid passage, and means for urging said compensation piston with a preset force into engagement with said piston rod, the position of said pressure pickup hole being shifted according to the delivery of said pump in order to attain a desired pressure and to control the pump output.

3,985,470

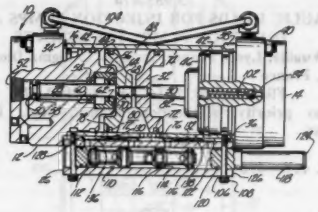
DUAL PRESSURE HYDRAULIC PUMP

Thomas B. Dalton, Muskegon, Mich., assignor to Westran Corporation, Muskegon, Mich.

Continuation-in-part of Ser. No. 421,217, Dec. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 160,614, July 8, 1971, Pat. No. 3,776,665. This application Oct. 14, 1975, Ser. No. 622,166

Int. Cl.² F04B *3/00*

U.S. Cl. 417—252 7 Claims



1. A fluid pump adapted to be driven by a pressurized fluid, said fluid pump comprising:

a housing having a bore separated on opposite sides into first and second, cylindrically formed, axially spaced pressure chambers,

piston means carried in said bore and having cylindrical portions at each end extending into said chambers;

means for reciprocating said piston means;

a first port means for each of said first pressure chambers and respectively communicating said first pressure chambers to a source of fluid;

a second port means for respectively exhausting said first pressure chambers;

valve means normally closing communication between said first pressure chambers and their associated second port means;

outlet port means communicating with said first and second pressure chambers;

means responsive to a predetermined outlet pressure to actuate said valve means to open communication between said first chambers and said second port whereby fluid in said first chamber is exhausted through said second port means and fluid is thereafter delivered to said outlet port means only from said second pressure chamber;

said means for reciprocating said piston means comprising a piston having a pressure responsive area substantially exceeding the effective area of each of said piston means, said piston and said piston means being detachably mounted together and being reciprocally mounted in said housing on a coextensive axis,

means for automatically supplying the pressurized gas to opposite sides of said piston to reciprocate said piston means;

said last mentioned means comprising a source of pressurized gas; a shuttle valve connected with said source of pressurized gas and operable in a first position to direct pressurized gas to one side of said piston and to exhaust the opposite side of said piston, and in a second position to exhaust and first mentioned side of said piston and to direct pressurized gas to the opposite of said piston;

valve means automatically moving said shuttle valve between said first position and said second position to automatically reciprocate said piston; and

a seal member disposed intermediate said piston and said shuttle valve and passages provided through said seal member to operably connect said shuttle valve and said piston.

3,985,471

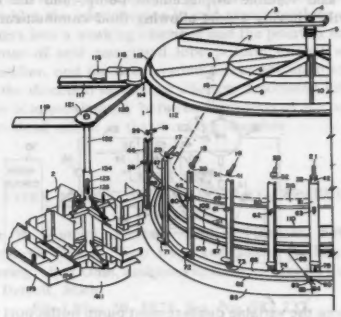
IMPELLER SHAFT TURNING DEVICE

Harold Seals, South Pittsburg, Tenn., assignor to Larry Harold Kline, Charleston, S.C.

Filed July 11, 1974, Ser. No. 487,819

Int. Cl.² F04B *17/00*

U.S. Cl. 417—405 10 Claims



1. An impeller shaft turning device for use in rotating the shaft of an impeller within a housing in a revolving machine to aid in impelling material into a bag comprising motor means operative to rotate said shaft of an impeller, hydraulic means operative to control said motor means, said hydraulic means comprising fluid supply means providing a flow of fluid to said hydraulic means; start and stop control means operative to start and stop flow of said fluid to said hydraulic motor; flow control means operative to control the quantity of fluid to said hydraulic motor after said start and stop control means allow flow of said fluid to said hydraulic motor, whereby said flow control valve controls the speed of rotation of said shaft; said fluid supply means comprising fluid source means operative to provide a source of fluid; a pressure header from which said fluid may flow to said hydraulic motor; a return header to which fluid may flow from said hydraulic motor; said fluid source means comprising:

a. hydraulic pump means connected to said pressure header and operative to pump said fluid to said pressure header;

b. pump motor driving means operative to control said hydrulic pump means;

c. a reservoir operative to hold a supply of fluid;

d. pressure relief means connected to said hydraulic pump means and operative to relieve pressure;

e. cooling means connected to said return header and operative to cool said fluid when it is returned to said reservoir from said return header.

3,985,472

COMBINED FIXED AND VARIABLE DISPLACEMENT PUMP SYSTEM

Eugene P. Virtue, Tinley Park, and Richard J. Lech, Lockport, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 23, 1975, Ser. No. 570,970

Int. Cl.² F04B *49/00*, *23/04*

U.S. Cl. 417—216 6 Claims

1. A fluid circuit comprising:

a work circuit having fluid actuated apparatus;

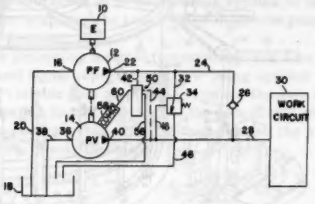
conduit means communicating with said work circuit;

a fixed displacement pump having an inlet port and an outlet port providing fluid delivery to said work circuit through said conduit means;

a variable displacement pump, having an inlet port and an outlet port and further having a destroking actuator providing fluid output to said work circuit through said conduit means;

a prime mover means for driving said fixed displacement pump and said variable displacement pump;

a dual pressure sensing compensator device having a housing with a cylindrical bore therethrough and a valve spool reciprocally mounted in the cylindrical bore providing a first chamber communicating with the output port of said fixed displacement pump, and a second chamber communicating through said conduit means with the outlet port of said variable displacement pump, and the housing further having a port allowing fluid communication between the variable displacement pump outlet port and the destroking actuator of said variable displacement pump through said conduit means;



an unloading valve responsive to pressure in said conduit means capable of directing the output flow from the fixed displacement pump to a reservoir; and

a check valve in said conduit means preventing fluid flow from passing between the outlet side of said variable displacement pump and the outlet side of said fixed displacement pump.

3,985,473

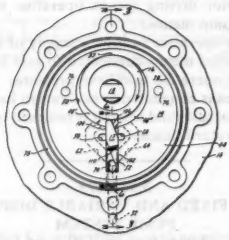
ROTARY PUMP

Robert W. King, Sidney, and Robert L. Anderson, De Graff, both of Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed July 10, 1975, Ser. No. 594,808

Int. Cl.² F04B *37/10;* **F01C** *21/16;* **F04C** *15/04*

U.S. Cl. 417—315 **17 Claims**



1. A rotary pump comprising:

a housing having an inner peripheral surface defining a cavity;

a rotor having an outer peripheral surface disposed in said cavity;

means for rotating said rotor in said cavity, said rotor and cavity defining between said inner and outer peripheral surfaces a rotating pump chamber having a volume which increases and decreases as said rotor is driver;

a fluid inlet passageway comminicating with said cavity;

a fluid outlet passageway communicating with said cavity; and

single vane means normally sealingly engaging the entirety of said outer peripheral surface of said rotor and said inner peripheral surface of said cavity in all relative positions thereof, said vane means being operable to control the flow of fluid through said inlet passageway and said outlet passageway, and being movable between a first position in which fluid is pumped from said inlet passageway to said outlet passageway when said rotor rotates in one direction and a second position in which said vane means causes fluid to be pumped from said inlet passageway to said outlet passageway when said rotor rotates in the opposite direction.

3,985,474

HYDRAULIC HEADS FOR INJECTION PUMPS AND THE INJECTION PUMPS THEMSELVES

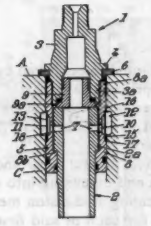
André Vuaille, Lyon, France, assignor to Sigma Diesel, Venissieux, France

Filed Sept. 4, 1974, Ser. No. 503,078

Claims priority, application France, Sept. 12, 1973, 73.32846

Int. Cl.² F04B *7/04*

U.S. Cl. 417—490 **5 Claims**



1. Hydraulic head for an injection pump, comprising, a cylinder forming a pump chamber in which a pump piston is intended to move, said cylinder comprising at least one fuel supply orifice formed in the cylindrical wall thereof, said hydraulic head being provided with a deflector element, disposed axially at the level of said supply orifice, for deflecting a jet of fuel capable of emerging from said orifice, and a delivery connector connected to the cylinder, said deflector element being constituted by an elastic ring of cylindrical form, said ring being circumferentially open and comprising two ends which are separable from one another, said head comprising a monoblock housing for the elastic ring comprising shoulders which define an annular groove and serve as an axial stop for the elastic ring, so that, during the mounting of said ring in said housing, the ends of the ring are separated from one another, the inner diameter of the elastic ring, when its ends are in contact, being greater than the diameter of the annular groove around which the ring is mounted.

3,985,475

EXPANSIBLE CHAMBER DEVICE

George W. Gatecliff, Saline, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

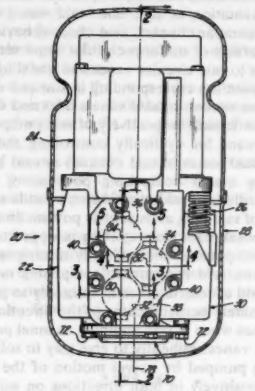
Filed Feb. 20, 1974, Ser. No. 443,976

Int. Cl.² F02B *75/26*

U.S. Cl. 417—539 **28 Claims**

1. An expansible chamber device having at least two pistons each individually received in an associated cylinder, a crankshaft having at least two separate crankpins operably connected with said pistons for reciprocal movement thereof in an associated cylinder in conjunction with rotary movement of said crankshaft, at least one of said pistons being offset from the axis of rotation of said crankshaft such that the center line of the cylinder associated with said one piston does not intersect the axis of rotation of said crankshaft, the axis of rotation of said crankshaft being located between the center lines of said cylinders such that there are center lines of cylinders on

both sides of the axis of rotation of said crankshaft, said crankpins being constructed and arranged on said crankshaft with an asymmetrical angular spacing with respect to each other about the axis of rotation of said crankshaft such that no two



pistons on opposite sides of the axis of rotation of said crankshaft will reach top dead center at the same time and also such that the peaks in the total torque on said crankshaft about its axis of rotation are substantially symmetrically angularly spaced throughout the revolution of said crankshaft.

3,985,476
ROTARY INTERNAL COMBUSTION ENGINE WITH VALVED INLET THROUGH PISTON

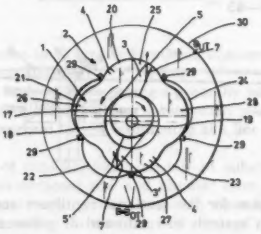
Peter Hofbauer, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Jan. 31, 1975, Ser. No. 546,015

Claims priority, application Germany, Feb. 6, 1974, 2405557

Int. Cl.² F01C *1/02, 21/12;* **F02B** *55/14*

U.S. Cl. 418—61 B **6 Claims**



1. An internal combustion engine comprising an engine housing having a plurality of arcuate recess portions on the interior surface thereof and a piston arranged for planetary rotation within said housing and having, on its exterior surface, a plurality of convex lobe portions adapted for cooperation with recess portions of said housing to form working chambers therebetween,

said piston further having an inlet and an exhaust channel extending therethrough to a respective inlet and exhaust opening in every other lobe portion thereof,

each said inlet and exhaust opening being controlled by the positions of their associated lobe portion of said piston with respect to the recess portions of said housing,

the improvement wherein said piston further comprises a spring loaded check flap arranged in each inlet channel, each said check flap being arranged in its associated channel with its center of mass located with respect to the pole of acceleration of the piston such that the acceleration forces, occurring as the piston revolves, act upon said flap in the direction of opening when its associated lobe portion is approximately in the region between the point at which the inlet opening in said associated lobe portion enters into a working chamber and the point of top dead center of said associated lobe portion in that working chamber, and the acceleration forces act upon said flap in the direction of closing when its associated lobe portion is approximately between the points of top and bottom dead center in that working chamber.

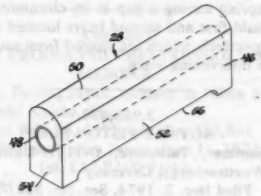
3,985,477
TUBE CORE APEX SEAL FOR ROTARY COMBUSTION ENGINE

Warren W. Antrim, Dayton; Gene P. Baynes, Kettering; Thomas C. Downs, Tipp City, and James E. Enghauser, Kettering, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 30, 1975, Ser. No. 582,232

Int. Cl.² F01C *19/04, 21/00;* **F04C** *27/00*

U.S. Cl. 418—122 **3 Claims**



1. In a rotary combustion engine comprising a rotor housing defining an inner peripheral surface in the shape of an epitrochoid, said rotor housing interconnecting two parallel end walls, the rotor housing and end walls defining a rotor cavity, a rotor rotatably mounted in said rotor cavity, said rotor having circumferentially spaced apex portions each including a slot aligned parallel to the rotational axis of said rotor and containing a spring-biased apex seal adapted to engage said peripheral surface in sliding, sealing contact, the improvement wherein said apex seal comprises:

a hollow, tubular, metal core member embedded in a wear resistant body member consisting essentially of carbon particles uniformly distributed through a metal matrix, the core member being disposed longitudinally in said seal, said hollow core member providing a reduction in weight of said seal without reducing the flexural strength or wear resistance as compared to an apex seal of the same external size and shape but formed fully of said body member material.

3,985,478
ROTARY ENGINE ANTI-SPIN OIL SEAL

Louis H. Weinand, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

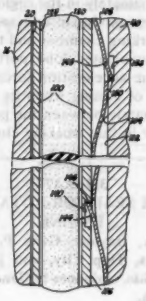
Filed Nov. 7, 1973, Ser. No. 413,545

Int. Cl.² F01C *19/00*

U.S. Cl. 418—142 **6 Claims**

1. An oil sealing assembly for a rotary engine comprising: a wavy spring having a plurality of crests and valleys; a first burr projecting from a crest of said wavy spring generally upwardly with respect to said crest; an oil seal; a recess in said oil seal, said first burr being seated in said recess in said oil seal whereby relative movement between said wavy spring and said

oil seal is eliminated when said wavy spring and said oil seal are positioned in a rotary engine; said wavy spring including a second burr positioned generally on a valley thereof and projecting downwardly with respect to said valley and with respect to said first burr for being received in a recess of a rotor into which said oil sealing assembly is to be inserted; said



second burr comprising a hole punched in said wavy spring with portions of the material of said wavy spring projecting from the surface thereof around said hole to define said burr; said wavy spring having a gap in its circumference defining split ends, said first and second burrs located on a crest and a valley respectively which are spaced from said split ends by at least one intervening wave.

3,985,479

ROTARY PISTON PUMP

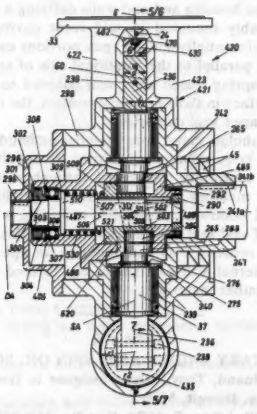
Manfred Sommer, Talstrasse, D-7101 Untergruppenbach, (Baden-Wurttemberg), Germany

Filed Dec. 2, 1974, Ser. No. 528,733

Claims priority, application Germany, Dec. 5, 1973, 2360617; Austria, Nov. 29, 1974, 9590/74

Int. Cl.[2] F01C *1/00, 19/02, 21/00;* **F04C** *1/00*

U.S. Cl. 418—146 **28 Claims**



1. A rotary piston fluid pump comprising a casing having an annular channel therein, a hub rotatably supported in said casing concentric with said annular channel, said hub comprising a drive shaft portion rotatable in said casing and an overhanging annular flange portion at an inner end of said drive shaft portion and having a central space inside said annular flange portion, said flange portion being disposed wholly radially inwardly of said annular channel of the casing, means providing a fluid tight seal between said hub and said casing, means for rotating said hub, a plurality of circumferentially spaced generally radial shafts extending through and rotatably supported by said annular flange portion of said hub, a flat circular disc-shaped vane mounted on the outer end of each of said radial shafts and disposed in said annular channel whereby upon rotation of said hub, said vanes are carried around in said annular channel, said channel having an arcuate pumping portion of uniform circular cross section corresponding in size to said circular vanes and a sealing portion of restricted cross section corresponding in size and shape to the diametrical cross section of said vanes, inlet and outlet openings at the opposite ends respectively of said pumping channel portion and means for cyclically controlling the rotational orientation of said vanes in said channel as said hub rotates, said controlling means comprising portions of said shafts extending inwardly into said central space inside said annular flange portion of said hub, an eccentric portion on each of said shafts, and opposed cam means acting in opposite directions on said eccentric portions for cyclically turning said shafts to orient said vanes, said cam means comprising means acting resiliently on said eccentric portions normally to position said vanes approximately perpendicular to the direction of movement of the vanes when in said pumping channel portion while permitting said vanes resiliently to give way to solid bodies in the fluid being pumped by swivel motion of the vanes, and means acting positively in both directions on said eccentric portions to position said vanes in line with said direction of movement when entering said sealing portion, the circumferential length of said sealing channel portion being at least slightly greater than the spacing between successive vanes whereby one vane enters the upstream end of said sealing channel portion sufficiently to form a seal therein before the preceding vane exits from the downstream end of said sealing channel portion.

3,985,480

APPARATUS FOR THE SECTIONAL CANTILEVER CONSTRUCTION OF BRIDGE GIRDER SYSTEMS

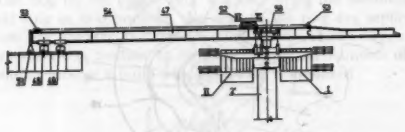
Klemens Finsterwalder, Ahornweg, Germany, assignor to Dyckerhoff & Widmann AG, Munich, Germany

Continuation of Ser. No. 389,618, Aug. 17, 1973, abandoned. This application Apr. 10, 1975, Ser. No. 566,709

Claims priority, application Germany, Aug. 18, 1972, 2240678

Int. Cl.[2] E01D *1/00;* **B28B** *23/02*

U.S. Cl. 425—63 **16 Claims**



1. Apparatus for the sectional cantilever construction of bridge girder systems of reinforced or prestressed concrete having a superstructure comprising a closed box cross-section and superposed laterally overhanging bridge deckings, said apparatus comprising

travel devices comprising a laterally spaced pair of wheel means operating on the upper surface of an already finished part of the bridge superstructure,

a pair of similarly constructed longitudinal girders extending on opposite sides of the superstructure below the level of the laterally overhanging bridge deckings,

a pair of half-frames extending around opposite sides of the overhanging bridge deckings and each connecting that travel device on its side of the superstructure to the longitudinal girder on its side in a region intermediate the length of the girder to carry said girders in suspended position and thereby define front portions of said girders

which may be projected beyond the finished part of the superstructure and rear sides of the girders extending underneath the overhanging bridge deckings of the finished part of the bridge,

jack means on the rear sides of said girders positioned to press against the undersurface of the overhanging deckings of the finished part of the superstructure,

jack means associated with said wheel means of the travel devices positioned to abut against the upper surface of the finished part of the superstructure whereby to inactivate said wheel means,

said jack means on the rear sides of said girders being adapted to cooperate with the jack means associated with the wheel means to fix the position of and support the apparatus,

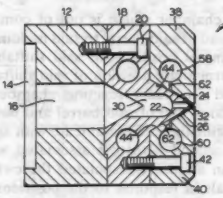
shuttering means adapted to shape at least a part of the bottom portion of said superstructure, said shuttering means comprising reinforcing means applied to the outer surfaces thereof,

said shuttering means being connected to the front portion of said girders through the reinforcements, whereby during concreting, the shuttering means is supported from the longitudinal girders and said girders are supported by said jacks from the completed superstructure of the bridge.

3,985,481
EXTRUSION HEAD FOR PRODUCING POLYMERIC MATERIAL FIBRES

Warren A. Brackmann, Cooksville, and Daniel DiIanni, Toronto, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Division of Ser. No. 530,708, Dec. 9, 1974. This application Sept. 24, 1975, Ser. No. 616,426
Int. Cl.² B29F 3/04
U.S. Cl. 425—72 S **8 Claims**



1. An extrusion head for the formation of polymeric material fibers comprising:

an elongate body member having a generally wedge-shaped cross section including two substantially planar sloping faces convergent to and terminating at a line of intersection,

a plurality of capillary-like channels of substantially the same cross-sectional size and circular cross section located in said body member and each extending from an individual orifice formed at said line of intersection spaced apart from the individual orifice of the other channels internally of said body member substantially parallel to and separated from others of said channels and substantially perpendicular to said line of intersection, whereby the axis of each of said channels and said line of intersection lie in a first plane,

first supply means in fluid flow communication with the ends of said plurality of channels remote from said line of intersection for feeding molten polymeric material through said plurality of channels towards said orifices,

a first elongate block member having a face of complementary shape to that of one of said two planar sloping faces and secured in engagement with said one of said two planar sloping faces, a second elongate block member having a face of complementary shape to that of the other of said two planar sloping faces and secured in engagement with said other of said two planar sloping faces,

said complementary-shaped faces each having one longitudinal edge located substantially common with said line of intersection, whereby said block members engage each other at said line of intersection,

a plurality of grooves formed in each of said complementarily-shaped faces of equal number to each other and to the number of said plurality of capillary-like channels, each of said grooves defining a passage with the adjacent planar sloping face of said body member,

said grooves in each said complementarily-shaped face being parallel to each other and having substantially the same cross-sectional shape,

respective grooves in each said complementarily-shaped face and one of said channels being arranged to lie in a second plane situated substantially perpendicularly to said line of intersection and to said first plane,

respective grooves terminating at said line of intersection in an opening, and

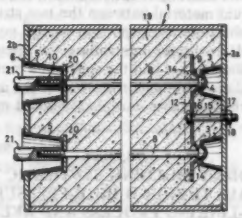
second supply means in fluid flow communication with each of said plurality of passages remote from said line of intersection for feeding air under pressure to said plurality of passages towards said line of intersection,

each of said orifices having a circular cross section when viewed along the intersection of said first and second planes and having a part-elliptical cross section when viewed along said second plane towards said first plane.

3,985,482
DEVICE FOR PRODUCING PRESTRESSED CONCRETE MEMBER

Shigeru Suzuki, Fuchu, Japan, assignor to Nihon Kogen Concrete Kabushiki Kaisha, Japan

Filed Feb. 25, 1975, Ser. No. 553,044
Claims priority, application Japan, June 11, 1974, 49-66878
Int. Cl.² B28B 21/60
U.S. Cl. 425—111 **13 Claims**



1. A device for producing a prestressed concrete member, comprising:

a mold including a first panel having at least one fixing metal piece projecting inwardly from the inner surface thereof, said fixing metal piece being substantially cup-shaped and having a concave portion in the innermost surface thereof, a second panel having at least one opening therein and having at least one guide metal piece disposed in said opening and extending inwardly therefrom, said guide metal piece being substantially cup-shaped and having a hole therein, the open end of said guide metal piece facing outwardly, at least one tensioning steel member, said first and said second panels being arranged in opposing relation, said tensioning steel member having one end provided with an upset head portion, an anchor plate engaging the side opposite the free end of said head portion and being spaced from and fastened to said first panel, said head portion engaging said innermost surface of said fixing metal piece, and the end of said tensioning steel member opposite said head portion

having a threaded portion extending into said guide piece through said hole in said guide piece, and a nut member threaded on said threaded portion.

3,985,483

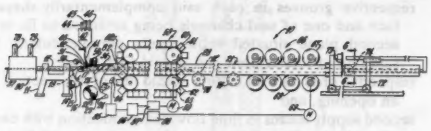
APPARATUS FOR MAKING FOAMED PLASTIC PIPE INSULATION

Frank M. Clay; Leland G. Moran, and Russell R. Lawyer, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 31, 1975, Ser. No. 545,953

Int. Cl.[2] B29D *27/04*

U.S. Cl. 425—112 **14 Claims**



1. Apparatus for making foamed plastic insulation comprising means for supplying a first strip of material, means for supplying a second strip of material in spaced parallel relationship with the first strip of material, a conduit having an outlet end portion disposed between the strips of material and dispensing foamable hardenable liquid material during the making of the insulation, supply means for supplying foamable hardenable liquid material to an inlet end portion of the conduit, motor-driven pulling means for pulling insulation formed by the two strips of material and cured foam horizontally to draw the two strips of materials respectively from their supplying means, motor-driven conveyor-mold means between the outlet end portion of the conduit and the pulling means for confining one of the two strips of material during the making of the insulation as the foamable hardenable liquid material foams and cures and for aiding the pulling means in the pulling of the insulation, and infrared sensing means operatively associated during the making of the insulation with the foamable hardenable liquid material between the two strips of material and between the outlet end portion of the conduit and the conveyor-mold means for controlling the speed of a motor driving the pulling means and the speed of a motor driving the conveyor-mold means in accordance with the amount of heat generated by the foamable hardenable liquid material.

3,985,484

METHOD OF MOLDING SYNTHETIC RESINS MATERIALS THROUGH HIGH-PRESSURE FLUID CROSS-LINKING PROCESS AND RELEVANT APPARATUS

Mamoru Takiura, Kawasaki, Japan, assignor to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan

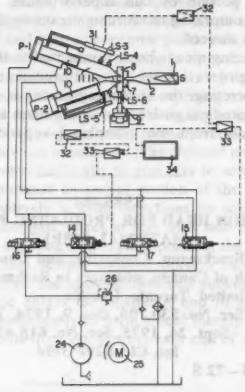
Division of Ser. No. 289,993, Sept. 18, 1972, Pat. No. 3,876,736. This application Jan. 15, 1975, Ser. No. 541,269

Claims priority, application Japan, Sept. 30, 1971, 46-75818

Int. Cl.[2] B29B *1/06*

U.S. Cl. 425—145 **1 Claim**

1. An apparatus for molding a mixture of a synthetic resin and a cross-linking agent by a high-pressure fluid cross-linking process, comprising: a barrel having a rotatable screw mounted therein for reciprocating movement, means associated with said screw for rotating said screw for plasticizing said mixture and forwarding same to a main reaction chamber located inside said barrel adjacent the discharge end thereof, and fluid pressure motor means connected to said screw for imposing a back pressure on said screw to resist retracting movement thereof so that a charge of plasticized material accumulates at the discharge end of said barrel and is maintained under said back pressure, said fluid pressure motor means also being effective to advance the screw to discharge said plasticized charge from said main reaction chamber; a pair of limit switches associated with said screw; a transfer valve connected to the discharge end of said barrel; means defining first and second secondary reaction chambers having reciprocable plungers therein, each plunger having a fluid pressure motor associated therewith for reciprocating said plungers, and a pair of limit switches associated with each plunger, said secondary reaction chambers being connected to said transfer valve; a molding head die connected to said transfer valve; said transfer valve having a shiftable valve means and a fluid pressure motor for moving said shiftable valve means between two terminal positions and an intermediate position, said shiftable valve means having passages for connecting the discharge end of said barrel alternately to said secondary reaction chambers and for connecting the secondary reaction chamber which is out of communication with the discharge end of said barrel to said molding head die in the respective terminal positions of said shiftable valve means, and in the intermediate position of said shiftable valve means neither of said secondary reaction chamber communicates with the discharge end of said barrel and both of said secondary reaction chambers communicate with said molding head die; first and second detectors associated with said plunger each having an amplifier associated therewith for providing electrical signals in response to the positions of the plungers in the first and second secondary reaction chambers, respectively; an automatic controller for supplying electrical control signals for controlling operation of the plungers; a further pair of amplifiers both connected to said controller and each being connected to the amplifier of one detector so as to respond to the combined signals from said controller and one of said detectors; a first fluid pressure circuit comprising servo valves operated by said further pair of amplifiers for controlling movement of said plungers; and a second fluid pressure circuit comprising valves connected to control the supply of fluid pressure to said fluid pressure motor for said screw and said fluid pressure motor for said shiftable valve element, so that said screw is rotated and is permitted to retract in said barrel against back pressure in the fluid pressure motor for the screw until one of the limit switches associated with the screw is actuated whereupon rotation of the screw is stopped and then the screw is advanced, simultaneously the shiftable valve element is positioned in one terminal position so that the charge in the discharge end of the barrel is fed into one of the secondary reaction chambers against a back pressure on the plunger therein and a previously fed-in charge in the other secondary reaction chamber is discharged therefrom through the molding head die by advancing the plunger therein and when the latter plunger actuates one of its associated limit switches advancing movement of the latter plunger is slowed down and simultaneously advancing movement of the plunger



in said one secondary reaction chamber is begun and said shiftable valve element is shifted to its intermediate position so that plasticized material is fed into said molding head die from both secondary reaction chambers, and when said plunger in said other secondary reaction chamber actuates its other limit switch, advancing movement of said latter plunger is stopped and the valve is shifted to its other terminal position, whereupon the cycle repeats with the operations of the secondary reaction chambers being reversed.

3,985,485

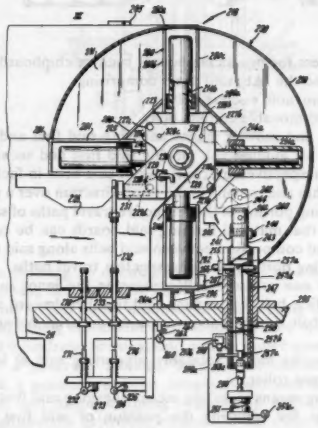
BLOW MOLDING APPARATUS WITH MULTIPLE CYCLE CORE RODS

John J. Farrell, Green Brook, N.J., assignor to Consupak, Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 476,092, June 3, 1974, Pat. No. 3,923,441. This application Nov. 28, 1975, Ser. No. 635,898

Int. Cl.² B29C *17/07*

U.S. Cl. 425—242 B **17 Claims**



1. An injection blow molding apparatus comprising, an indexing turntable for indexing about an axis to a plurality of stations, including an injection station for injection molding parisons onto core rods, a transition station, a blow molding station, and a stripping station, a plurality of core rods for carrying the parisons mounted to said turntable about an axis transverse to the axis of said turntable, said core rods being rotatable about said transverse axis at the transition station, and a plurality of core rods mounted to said turntable at each of the other stations, means to rotate the core rods about the transverse axis at the transition station, whereby one core rod is rotated to a temperature conditioning operation, and a second core rod is simultaneously rotated from a temperature conditioning operation to the place occupied by said one core rod, and a third core rod is simultaneously rotated from one conditioning operation to another conditioning operation, said means to rotate the core rods being actuated so as to rotate the core rods in the same direction so that each core rod undergoes one complete 360° rotation about the transverse axis at the transition station.

3,985,486

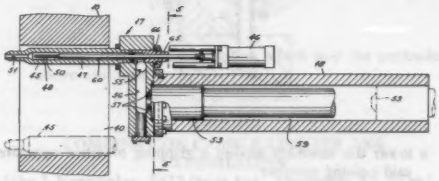
ADJUSTABLE MANIFOLD AND NOZZLE ASSEMBLY FOR FOAM MOLDING MACHINES

James W. Hendry, Holland, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Dec. 20, 1974, Ser. No. 534,540

Int. Cl.² B29F *1/03*

U.S. Cl. 425—248 **9 Claims**



1. In an injection molding machine having a clamp section consisting of a fixed front plate and a moving plate with mold sections affixedly held and clamped therebetween, one of said mold sections containing sprue openings, wherein said sprue openings have arbitrary locations, and an extruder means upstream of said sprue openings for plasticizing resin wherein the improvement comprises:

a plurality of slot means through said front plate wherein said sprue openings in one of said mold sections correspond with said slot means;

a nozzle means disposed in said slot means; said slot means being configured as an oblong form having a width dimensionally larger than diameter of said nozzle with said oblong dimension at least twice the diameter of said nozzle;

the axis of said nozzle means being disposed through said slot means, said nozzle means affixed to a manifold means, wherein said manifold means is fixedly attached to a carriage means;

said carriage means adjustably affixed to machine base means; and

said carriage means adjustable perpendicular to said nozzle axis wherein said nozzle means can be moved within said slot means simultaneously to align with said sprue openings.

3,985,487

APPARATUS FOR MAKING POLYTETRAFLUOROETHYLENE SEALING ELEMENTS WITH HYDRODYNAMIC ACTION

William E. Clark, Chelsea, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Division of Ser. No. 523,451, Nov. 13, 1974, Pat. No. 3,929,341, Continuation-in-part of Ser. No. 426,365, Dec. 19, 1973, abandoned. This application Sept. 18, 1975, Ser. No. 614,680

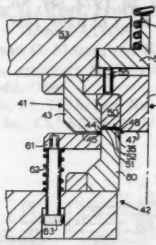
Int. Cl.² B29C *17/00*

U.S. Cl. 425—304 **8 Claims**

1. A die for coining a wafer of material such as polytetrafluoroethylene, including in combination:

an upper die assembly having an annular spring-supported coining member having a flat gripping portion and a

recessed forming portion into which said wafer material cold-flows during coining, and



a lower die assembly having a gripping member opposite said coining member.

3,985,488

MATERIAL GUIDE JAW FOR TWO CO-OPERATING ROLLS OF A ROLLING MILL OR CALENDER

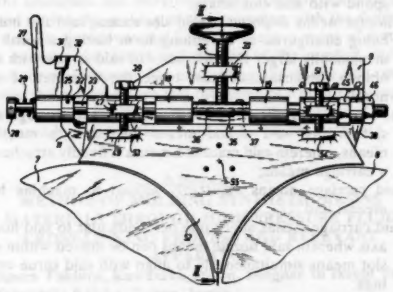
Manfred Hoffmann, Hannover, Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Kleefeld, Germany

Filed Nov. 10, 1975, Ser. No. 630,725

Claims priority, application Germany, Nov. 28, 1974, 2456251

Int. Cl.² B29C *15/00*; B29D *7/14*; B30B *3/00*

U.S. Cl. 425—363 **4 Claims**



1. A material guide jaw for two co-operating rolls having a roll gap therebetween into which material to be processed can be fed, the material guide jaw comprising a fixed carrier, a base plate mounted on said fixed carrier in such manner that the base plate is displaceable at right-angles to the plane of the axes of the two rolls, a pivot shaft, bearing lugs on the base plate mounting the pivot shaft in a manner to prevent longitudinal displacement of the pivot shaft with respect to the base plate, an intermediate plate mounted on said pivot shaft and longitudinally movable thereon for adjustment in a direction transverse to the direction in which said base plate is displaceable; and a jaw plate, one face of which jaw plate forms a guide surface for the material which is to be processed, said jaw plate being mounted on the intermediate plate for rotation with respect to said intermediate plate about a pivot axis located at a middle part of said intermediate plate and extending perpendicular to the plane of said intermediate plate.

3,985,489

CONTINUOUSLY OPERATING PRESS FOR MANUFACTURE OF PANELS, SUCH AS CHIPBOARDS, FIBERBOARDS, OR THE LIKE

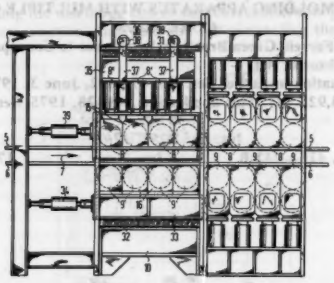
Albert de Mets, Kachtem, Izegem, Belgium, assignor to Bisonwerke Bahre & Greten GmbH & Co. KG, Germany

Filed Jan. 23, 1975, Ser. No. 543,429

Claims priority, application Germany, Jan. 23, 1974, 2403209

Int. Cl.² B29C *15/00*

U.S. Cl. 425—371 **15 Claims**



1. A press for producing boards such as chipboards, fiberboards, and the like; said press comprising:

a first movable endless belt,

a second movable endless belt,

guiding and moving means engaging said first and second belts for guiding and moving said first and second belts with respective outer surfaces of said belts in facing relationship and moving in the same direction over a material pressing portion of the respective travel paths of said belts such that material forming said boards can be conveyed by and compressed between said belts along said material pressing portion of said respective travel paths,

at least one pressure roller engaging the inner surface of said first belt for pressing said first belt toward said second belt during compression of material between said belts,

first bearing means rotatably supporting said at least one pressure roller,

adjusting means including means engaging said first bearing means for adjusting the position of said first bearing means in a direction parallel to the travel path of said belts,

and second bearing means engaging said first bearing means for limiting frictional resistance of said first bearing means to adjustment thereof by said adjusting means.

3,985,490

APPARATUS FOR EXTRUDING A HOMOGENEOUS TUBULAR LENGTH OF SOFT THERMOPLASTIC MATERIAL

Reiner Kader, St. Augustin, Germany, assignor to Mauser Kommanditgesellschaft, Cologne, Germany

Filed June 4, 1974, Ser. No. 476,304

Int. Cl.² B29D *23/04*

U.S. Cl. 425—381 **6 Claims**

1. An apparatus for extruding a tube of relatively soft thermoplastic material comprising;

a generally cylindrical housing having an interior wall and a longitudinal axis;

a generally cylindrical core member extending through at least a portion of said cylindrical housing and being coaxially aligned therewith; said core member having a longitudinal bore extending therethrough; said core member having a lower end provided with a downwardly

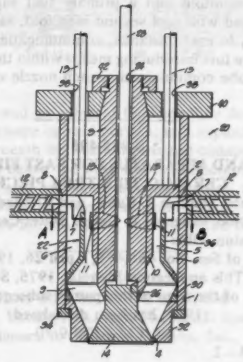
opening cavity communicating with said longitudinal bore;

a mandrel having an upper portion slidably disposed in said cavity in said lower end of said core member; said mandrel having an outwardly flaring lower portion extending downwardly through the lower end of said housing and terminating in an enlarged, generally circular bottom end;

a generally annular die member having an upper end disposed within said lower end of said housing and a lower end extending downwardly through said lower end of said housing and surrounding said lower end of said mandrel;

said lower ends of said die member and said mandrel defining an annular space therebetween;

a control rod extending downwardly through said longitudinal bore in said core member and having a lower end connected to the upper end of said mandrel for moving said mandrel upwardly and downwardly;



means defining an opening in the wall of said housing for receiving thermoplastic material;

a double walled piston mounted in said housing for longitudinal sliding movement relative to said core member and said cylindrical housing; said double walled piston including: a generally annular, longitudinal extending outer wall; a generally annular, longitudinally extending inner wall; and means defining a generally semi-cylindrical, longitudinally extending channel in the outer surface of said outer wall;

said inner and outer annular walls of said piston defining an annular piston chamber therebetween;

said longitudinal channel having an open upper end in communication with said annular piston chamber; and

said longitudinal channel communicating with said opening in said wall of said cylindrical housing.

3,985,491

HOT STAMPING DIE CHASE

Harold W. King, Kansas City, Mo., assignor to Ethyl Development Corporation, Kansas City, Mo.

Filed Mar. 28, 1975, Ser. No. 562,813

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² B29C 17/00

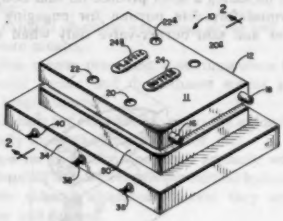
U.S. Cl. 425—384 **10 Claims**

1. A hot stamping die chase and die used for decorating hollow, plastic articles which comprises:

a. a heat transfer base;

b. a die carrying means and a die, said die carrying means carrying said die and being joined to said base; and

c. article support means having a face for supporting the surface of said article as it is brought into contact with said die, said article support means having at least one



opening therethrough through which said die protrudes above said face.

3,985,492

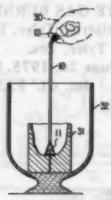
COMBINATION CANDLE LIGHTER AND EXTINGUISHER

John J. Nunemaker, 2422 Davis Ave., Alexandria, Va. 22302

Filed Dec. 5, 1974, Ser. No. 529,844

Int. Cl.² F23Q 25/00

U.S. Cl. 431—144 **17 Claims**



1. A combination candle lighter and extinguisher which comprises a substantially straight rod, candle extinguishing means affixed to one end of said rod, and match-holding means affixed to the other end of said rod, said candle extinguishing means comprising a receptacle-shaped body which is hollow and has an annular base defining a single opening in said base for receiving the candle's flame, said single opening being opposite the connection of said rod to said body, said body having substantially the same longitudinal axis as said rod, said annular base having sufficient cross-section and area to support said body and the remainder of the combination in an upright vertical position on a horizontal flat surface, the end of said rod opposite said body defining a further opening adapted to engage frictionally and hold a match opposite the head of the match, said match-holding means performing the function of supporting a match outwardly of said rod at an angle of not more than about 45° relative to the longitudinal axis of said rod.

3,985,493

CIGARETTE LIGHTER WITH AUTOMATIC GAS SHUTOFF

Guy Neyret, Francheville, France, assignor to Societe Anonyme dite: Etablissements Genoud & Cie., Vennissieux, France

Filed Sept. 18, 1975, Ser. No. 614,620

Claims priority, application France, Sept. 24, 1974, 74.32783

Int. Cl.² F23Q 2/00

U.S. Cl. 431—150 **7 Claims**

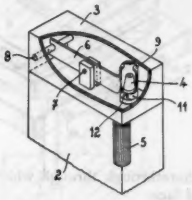
1. A lighter comprising:

a reservoir body,

a burner-valve on said body displaceable between an open position allowing gas to escape from said body to form an ignitable jet and a closed position preventing such escape,

a cover on said body displaceable between a down position enclosing said burner-valve and an up position uncovering said burner valve,

means including a lever pivoted on said body and having a thermodeformable portion for engaging between said cover and said burner-valve only when said portion is



relatively cool to displace said burner-valve into said open position on displacement of said cover into said up position and for disengaging said cover from said burner-valve when relatively hot, and

means for conducting heat from a flame formed at said jet to said thermodeformable portion.

3,985,494

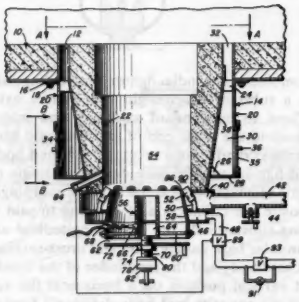
WASTE GAS BURNER ASSEMBLY

Herman Travis Childree, Tyler, Tex., assignor to Howe-Baker Engineers, Inc., Tyler, Tex.

Filed June 26, 1975, Ser. No. 590,503

Int. Cl.² F23C *5/28*

U.S. Cl. 431—175 **9 Claims**



1. A burner assembly for the utilization of a secondary fuel comprising: a combustor section including an outlet end adapted for installation to a furnace and an inlet end for cooperative attachment to primary and secondary fuel sources and igniter and burner means; primary fuel supply means including, in part, plural high velocity fuel nozzles, secondary fuel supply means; a constricted section on the inlet end of said combustor section establishing a low pressure zone extending around the periphery and inward of said combustor section inlet end; said constricted section having means therein for introducing fuel into said combustor section in the low pressure zone established by said constricted section; said high velocity fuel nozzles discharging into and through said fuel introducing means, said secondary fuel supply means communicating with said fuel introducing means and responsive to the high velocity fuel nozzle flow for ingestion of secondary fuel from said secondary fuel supply means into said fuel introducing means, the primary and secondary fuels thus being caused to intimately mix within and by said fuel introducing means; means in communication with said combustor section for the introduction thereinto of primary combustion air, said air introduction means having an operative relationship to said combustor section and said fuel introducing means and said constricted section so that said primary combustion air is directly responsive to the discharge from said fuel introducing means; said constricted section being defined by a skirt generally coaxial with the inlet end of the combustor section and laterally offset inward thereof so as to define an outwardly offset step between the skirt and the inner wall of the combustor section, said low pressure zone being established immediately above the step, said means for introducing fuel into said combustor section discharging upward through said step, said means for introduction of primary combustion air communicating with said combustor section through the internal area defined by said skirt, said secondary fuel supply means comprising a manifold defined immediately below said step, said fuel introducing means having an inlet section communicating with the interior of said manifold, a secondary fuel supplying conduit communicating with said manifold, said primary fuel supply means comprising a second manifold adjacent said first mentioned manifold and a primary fuel supplying conduit communicated with said second manifold, said high velocity fuel nozzles, in each instance, communicating with the inlet section of the fuel introducing means within the first manifold, and a fuel tube communicating each nozzle with said second manifold.

3,985,495

METHOD AND APPARATUS FOR FAST FIRING GLAZED CERAMIC TILE TRIM PIECES

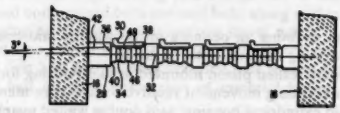
John A. Cable; Stephen J. Cable, and Richard R. Falbo, all of Canton, Ohio, assignors to United States Ceramic Tile Company, Canton, Ohio

Division of Ser. No. 464,471, April 26, 1974, Pat. No. 3,884,619. This application May 12, 1975, Ser. No. 576,719

The portion of the term of this patent subsequent to Mar. 20, 1992, has been disclaimed.

Int. Cl.² F27B *9/30*

U.S. Cl. 432—2 **5 Claims**



1. A method for producing glazed ceramic pieces in a heated firing chamber having conveying means for conveying said pieces through the heated firing chamber which includes supplying ceramic pieces with a coating of glaze material to said conveying means, heating said coated ceramic pieces being conveyed through said heating chamber at firing temperatures required in a firing process for said glazed ceramic pieces, replacing the glaze coated ceramic pieces supplied to said conveying means with non-glaze coated absorbent cleaning refractory shapes having a low thermal expansion characteristic and a high absorption characteristic, and causing glaze deposits on said conveying means to transfer to said absorbent cleaning refractory shapes during passage of said refractory shapes by said conveying means through the heated firing chamber.

3,985,496

WALKING BEAM DEVICE FOR CONVEYING MATERIALS AT HIGH TEMPERATURE

Henry L. Eickelberg, Rte. No. 4, Watertown, Wis. 53094

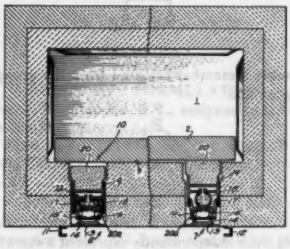
Continuation of Ser. No. 402,605, Oct. 1, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 542,596

Int. Cl.² F27B *9/14*

U.S. Cl. 432—122 **11 Claims**

1. A walking beam unit for high temperature conveying apparatus, comprising a base wall for a high temperature

furnace and having a longitudinal opening, an elongated beam means extended through the conveying apparatus within said opening, a longitudinal moving support means located within said base wall and beneath the beam means, an upwardly expandable means located within said base wall opening and between the beam means and the support means in spaced relation to the ends of the base wall and including a vertically



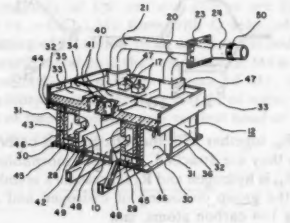
moving portion and an internal fluid medium for exerting a vertical fluid pressure on said portion, said expandable means being located beneath the beam means and collapsible to hold the beam means below the base wall and operable to exert a lifting force on said vertically moving portion to raise the beam vertically above the base wall, and means coupled to the support means for longitudinally moving of the beam means.

3,985,497

SCRAP PREHEATING SYSTEM

John R. Fellnor, Yardley, Pa., and Thomas J. Dzakowic, Delran, N.J., assignors to Melting Systems, Inc., Burlington, N.J.

Filed Nov. 21, 1974, Ser. No. 525,838
Int. Cl.² F27D *3/06*
U.S. Cl. 432—72 **7 Claims**



1. In a scrap preheating system including a conveyor on which the scrap to be preheated is positioned, enclosure means positioned over the conveyor and burner means associated with the enclosure means for directing flames upon the scrap, the improvements for eliminating unburned hydrocarbons comprising:

an elongate exhaust chamber extending along and adjacent the enclosure means;

communication means providing communication between the enclosure means and the exhaust means generally along the length thereof;

air bleeding means for introducing air to the exhaust chamber generally along the length thereof; and

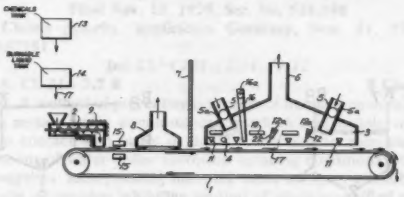
exhaust means for inducing a negative pressure within the exhaust chamber for drawing the unburned hydrocarbons through the exhaust chamber wherein they are mixed with the air and burned.

3,985,498

PROCESS AND DEVICE FOR DRYING CHEMICAL PRODUCTS

Walter Birke; Hans-Ulrich von der Eltz, and Franz Schon, all of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 302,852, Nov. 1, 1972, abandoned. This application Oct. 24, 1974, Ser. No. 517,767
Int. Cl.² F27B *9/00, 9/12;* **F26B** *17/02*
U.S. Cl. 432—136 **16 Claims**



1. An apparatus for drying a chemical material containing a burnable liquid by igniting and burning the liquid from the material without harming or damaging the material, comprising a burning chamber having two opposing walls, two lateral walls and a top wall, one of said opposing walls having an inlet for the material to be dried and the other of said opposing walls having an outlet for the dried material, means disposed outside of the burning chamber and ahead of the material inlet and operably connected to the chamber for providing on the material a burnable liquid, ignition means mounted in said chamber adjacent to said material inlet for igniting the burnable liquid while on the material, means for maintaining burning of said liquid including combustion air inlet means mounted on said chamber and approximate to said chemical material inlet and directed towards said chemical material, said top wall having an outlet for hot combustion gases, and a continuous transport means disposed adjacent to and below said ignition means and operably connected to said chamber for transporting said material through said chamber.

3,985,499

DIAZAMEROCYANINES FOR DYEING KERATINOUS FIBERS

Gerard Lang, Epinay-sur-Seine, and Andree Bugaut, Boulogne-sur-Seine, both of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 259,689, June 5, 1972, Pat. No. 3,869,454. This application Mar. 3, 1975, Ser. No. 554,701

Claims priority, application Luxemburg, June 4, 1971, 63287; Jan. 6, 1972, 64565; Aug. 30, 1974, 70835

Int. Cl.[2] A61K 7/13

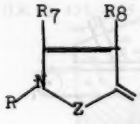
U.S. Cl. 8—10.1 **14 Claims**

1. A dye composition for dyeing keratinous fibers comprising an aqueous solution having a pH of between about 3 and about 8, of from about 0.0001 to about 5% by weight of at least one diazamerocyanine dye, including the mesomorphic forms thereof, having the formula

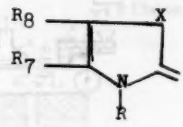
A=N—N=B

wherein

A represents a nitrogen heterocycle selected from the group consisting of



and



wherein

R represents a member selected from the group consisting of lower alkyl having 1–4 carbon atoms and phenyl;

X represents a member selected from the group consisting of sulfur, —NR′—, wherein R′ represents lower alkyl having 1–4 carbon atoms, $-CR'_9=CR'_{10}$ wherein R'_9 is hydrogen, alkyl of 1 to 4 carbon atoms or cyano and wherein R'_{10} is hydrogen or alkyl of 1 to 4 carbon atoms, and —C(R″)(R″)—, wherein each R″ is independently selected from the group consisting of hydrogen and lower alkyl having 1–4 carbon atoms;

Z represents a member selected from the group consisting of —CH=CH— and —NR‴, wherein R‴ represents lower alkyl having 1–4 carbon atoms,

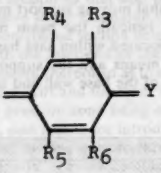
R_7 represents a member selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms, cyano and phenyl,

R_8 represents a member selected from the group consisting of hydrogen, halogen and lower alkyl having 1–4 carbon atoms, provided that R_7 and R_8, when taken together with the carbon atoms to which they are linked, represent benzene;

B represents a member selected from the group consisting of

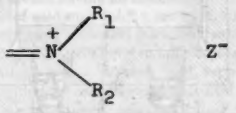
i. 1-phenyl-3-methyl-5-pyrazolone,

ii. a cycle of the formula



wherein

Y represents a member selected from the group consisting of oxygen and



wherein

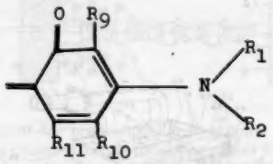
R_1 and R_2 each independently represent a member selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms, hydroxyalkyl having 1–4 carbon atoms and phenyl, and Z^- is an anion derived from a member selected from the group consisting of an inorganic acid and an organic acid,

R_3 represents a member selected from the group consisting of hydrogen, lower alkyl, lower alkoxy and phenylcarbamyl,

R_4 and R_6 each independently represent a member selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms and lower alkoxy having 1–4 carbon atoms, and

R_5 represents a member selected from the group consisting of hydrogen, halogen, alkyl of 1 to 4 carbon atoms, nitro, amino, acetylamino; R_5 and R_6 together with the carbon atoms to which they are attached being benzene or hydroxybenzene,

iii. a cycle having the formula



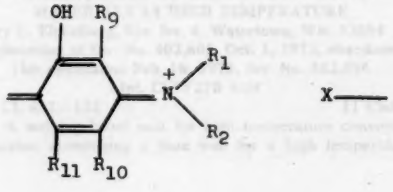
wherein

R_1 and R_9, together with the nitrogen and carbon atoms to which they are attached, represent morpholine in which case R_{10} is hydrogen and R_2 represents a member selected from the group consisting of hydrogen and lower alkyl having 1–4 carbon atoms, and

wherein

R_2 and R_{10}, when taken together with the nitrogen and carbon atoms to which they are attached, represent morpholine in which case R_9 is hydrogen and R_1 represents a member selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms and acyl having 2 to 5 carbon atoms, and R_{11} represents a member selected from the group consisting of hydrogen and lower alkyl having 1–4 carbon atoms, and

iv. a cycle having the formula



wherein

R_1, R_2, R_9, R_{10} and R_{11} have the meaning given above and X^- represents an anion derived from a member selected from the group consisting of an inorganic acid and an organic acid.

3,985,500

BLACK DYE FORMULATION

Clemens Streck, Loudonville, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,547

Int. Cl.² D06P *1/00, 3/00, 7/00;* D21H *1/46*

U.S. Cl. 8—25 17 Claims

1. A black dye formulation consisting essentially of a triarylmethane dye portion and a methine dye portion combined in a ratio of between about 1:1.2 and about 1:2.8 and wherein the triarylmethane portion is composed of C.I. Basic Blue 1 or a mixture of C.I. Basic Blue 1 and C.I. Basic Blue 5 and the methine portion is composed of a mixture of C.I. Basic Violet 16; C.I. Basic Yellow 29 and C.I. Basic Orange 21.

3,985,501

ION-EXCHANGE FABRIC OF FLUORINATED POLYMER CONTAINING PENDANT SIDE CHAINS WITH SULFONYL GROUPS

Walther Gustav Grot, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 4, 1974, Ser. No. 430,754

Int. Cl.² D06M *11/14*

U.S. Cl. 8—115.5 3 Claims

1. A woven fabric comprising fibers of a fluorinated polymer containing sulfonyl groups which are attached to carbon atoms which have at least one fluorine atom attached thereto wherein a majority of the sulfonyl groups are in the $-(SO_2NH)_mQ$ or $-(SO_3)_nMe$ form with Q selected from the group consisting of H, cation of an alkali metal and cation of an alkaline earth metal, m is the valence of Q, Me is a metallic cation, H, or NH_4 and n is the valence of Me, said fabric having the ability to pass less than 100 ml of water through a square inch of fabric exposed to a vertical head of 19 inches of water during a 60-hour time period.

3,985,502

METHOD OF CLEANING FABRICS

Edward J. Boorujy, 880 Mountain Ave., Berkeley Heights, N.J. 07922; Thomas P. Boorujy, 114 Grant Ave., New Providence, N.J. 07974, and Frank Higgins, 1462 Longhill Road, Millington, N.J. 07964

Filed May 19, 1975, Ser. No. 578,932

Int. Cl.² B08B *3/00*

U.S. Cl. 8—137 8 Claims

1. A method of cleaning a textile industrial filter which comprises the steps of (1) removing surface soil from said filters (2) washing said filter with an aqueous composition containing 0.1–10% by weight of an anionic wetting composition, 1–20% by weight of a nonionic liquid detergent mixture, 0.5–10% by weight of an organic solvent, and water, at a temperature of 150°–200°F. and then rapidly reducing the temperature by the rapid addition of water by about 40–60°, so as to remove the dirt impregnated therein.

3,985,503

PROCESS FOR INHIBITING METAL CORROSION

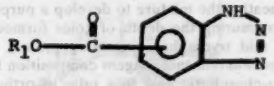
Cleveland O'Neal, Jr., Toledo, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Mar. 17, 1975, Ser. No. 558,766

Int. Cl.² C23F *11/12, 11/14*

U.S. Cl. 21—2.7 R 15 Claims

1. A process for inhibiting the corrosion of metals in contact with corrosive organic liquids and aqueous systems which comprises adding to the organic liquid or aqueous system a corrosion inhibiting amount of at least one carboxylated benzotriazole having the formula:



wherein R_1 is selected from the class consisting of hydrogen, an alkali metal and an aliphatic radical of 1 to 12 carbon atoms.

3,985,504

ANTICORROSIVE AGENT

Wolfgang Kindscher, Fussgoenheim, and Knut Oppenlaender, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 15, 1975, Ser. No. 524,048

Claims priority, application Germany, Nov. 21, 1973, 2357951

Int. Cl.² C23F *11/14, 11/12*

U.S. Cl. 21—2.7 R 8 Claims

1. A method of preventing corrosion of iron or iron-containing metals under circumstances in which said metals come into contact with water or liquid containing an appreciable amount of water under corrosion inducing conditions which comprises: incorporating into said water or water-containing liquid a corrosion inhibiting amount of alkali-saponified ene-adducts of maleic anhydride on at least one unsaturated fatty acid of from 12 to 24 carbon atoms and containing one olefin double bond, their esters or their amides, said corrosion inhibiting amount of said alkali-saponified ene-adducts being from 0.5 to 5% by weight, based on said liquid.

3,985,505

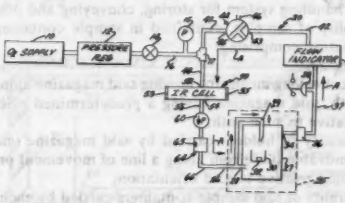
COMBUSTION SYSTEM

Roger L. Bredeweg, Stevensville, Mich., assignor to Leco Corporation, St. Joseph, Mich.

Filed Nov. 21, 1974, Ser. No. 525,998

Int. Cl.² G01N *31/12*

U.S. Cl. 23—230 PC 24 Claims



1. A method of promoting fast and complete combustion of an analytical specimen comprising the steps of:

providing a combustion furnace for the combustion of a specimen; and

circulating a gas through said combustion furnace in a loop during combustion of the specimen.

3,985,506

REAGENT AND METHOD FOR DETERMINATION OF GLOBULIN

Manik L. Das, Crestwood, Mo., assignor to Sigma Chemical Company, St. Louis, Mo.

Filed July 11, 1975, Ser. No. 595,239
Int. Cl.² G01N *21/02, 33/16*
U.S. Cl. 23—230 B **19 Claims**

1. In a method of determining a tryptophan-containing protein by a modified glyoxylic reaction comprising mixing a minor amount of a biological fluid with a reagent composition comprising sulfuric acid, a diluent, a colorimetric amount of glyoxylic acid, and a sensitizing amount of a sensitizing agent, thereafter heating the mixture to develop a purple color, and thereafter measuring the depth of color formed, hence the amount of said tryptophan-containing protein present, the improvement wherein said reagent composition further comprises ortho-phosphoric acid in a ratio of ortho-phosphoric acid to sulfuric acid of about 3:1 to about 1:3, said sulfuric acid and ortho-phosphoric acid together comprising from about 10 to about 50 parts per 100 parts by volume of said reagent composition.

8. A reagent useful for the determination of globulin in biological fluids, comprising per 100 ml of said reagent:

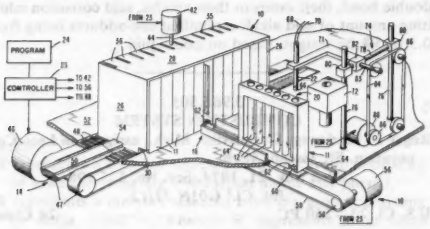
a. 50–90 ml acetic acid
b. 5–25 ml sulfuric acid
c. 5–25 ml ortho-phosphoric acid
d. a colorimetric amount of glyoxylic acid
e. a sensitizing amount of a sensitizing agent.

3,985,507

AUTOMATIC TEST SAMPLE HANDLING SYSTEM

Frank A. Litz, Hopewell Junction; Einar S. Mathisen, Poughkeepsie; Paul A. Schumann, Jr., Wappingers Falls, and Carl R. Valentino, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 5, 1975, Ser. No. 610,701
Int. Cl.² B65B *43/42;* **B65G** *65/02;* **G01N** *1/10, 21/24*
U.S. Cl. 23—253 R **10 Claims**



1. A handling system for storing, conveying and presenting a plurality of samples, contained in sample containers, to a work station comprising:

a magazine;

first conveying means for moving said magazine along a first path, said magazine having a predetermined orientation relative to such path;

a plurality of holders carried by said magazine and being removable therefrom along a line of movement predetermined relative to said orientation;

a plurality of said sample containers carried by each of said holders;

said work station being spaced from said first path;

and second conveying means intersecting said first path and extending adjacent to said work station;

said first conveying means being operative to locate said holders one-at-a-time at said intersection;

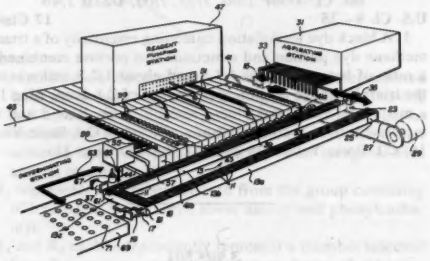
said second conveying means being operative to remove a holder, located at said intersection, from said magazine and transport such holder past said work station so as to selectively locate a predetermined sample container therein.

3,985,508

AUTOMATED CHEMICAL ANALYZER

Melvin Williams, 840 Elmwood, Evanston, Ill. 60202

Filed Oct. 28, 1975, Ser. No. 626,053
Int. Cl.² G01N *31/00*
U.S. Cl. 23—253 R **22 Claims**



1. Apparatus for automatically performing multiple chemical analyses of a plurality of discrete liquid specimens comprising:

means comprising a plurality of sample containers, each of the sample containers initially containing one of the specimens;

means comprising a plurality of reaction vessels in each of several parallel aligned rows;

means for loading a plurality of specimen test samples from each of the sample containers into a corresponding one of the rows of reaction vessels, the loading means including means for automatically aspirating the plurality of test samples from each of the sample containers and means for sequentially conveying the sample containers to and from the aspirating means, the aspirating means discharging the plurality of test samples aspirated from the sample container into the corresponding row of reaction vessels before aspirating the test samples from the sample container subsequently conveyed to the aspiration means;

means for transporting the several rows of reaction vessels in a continuous sequence from the aspirating means to a determinating station,

the conveying means conveying each of the sample containers from the aspiration means in parallel with the corresponding row of reaction vessels containing the test samples aspirated from the sample container;

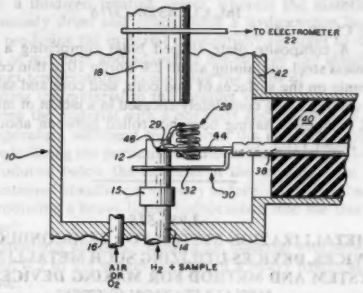
means comprising a plurality of switching devices being sequentially enabled by each of the sample containers being conveyed from the aspiration means for selectively adding reagents to certain ones of the reaction vessels, each of the switching devices being effective to cause one or more of the reagents to be added to selected ones of the reaction vessels in the row corresponding to the sample container enabling the switching device; and

means for automatically analyzing the reacted test samples at the determinating station and outputing the results of the analyses.

3,985,509
FLAME IONIZATION DETECTOR WITH FLAME MONITOR

Elmer Trone, Benecia, and Robert Leslie Howe, Livermore, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Feb. 13, 1976, Ser. No. 657,789
Int. Cl.² G01N *31/12*
U.S. Cl. 23—254 EF **14 Claims**



1. In a flame ionization detector for use in detecting separated components in the effluent from a gas chromatography column, said detector being of the type including an electrode gap, means for applying an electrical potential across said gap, a burner nozzle for providing a flame in the vicinity of said gap, means for introducing said effluent gas into said flame, and means for measuring the ion current through said electrode gap; the improvement enabling monitoring of said flame condition and ignition of an extinguished flame, comprising:

an igniter coil mounted proximate to said burner nozzle for igniting an extinguished flame;

thermocouple means including a hot junction in thermal contact with said burner nozzle, and a cold junction spaced from said nozzle, for sensing the temperature at said nozzle;

signal generating means for receiving the output from said thermocouple and generating a signal indicative of a flame-out condition;

means for applying an electrical potential to said igniter coil to heat said coil and thereby enable ignition of said flame upon said flame-out condition being indicated; and

a pair of electrical leads connected to provide both said electrical potential for heating said coil, and the interconnection between said thermocouple and said signal generating means.

3,985,510
FLASH REACTOR UNIT

Fred W. Taylor, 60 Village Circle, Bartow, Fla. 33830

Filed May 28, 1974, Ser. No. 473,675
Int. Cl.² C02C *3/00*; B01J *8/18*; F23G *5/00*
U.S. Cl. 23—284 **6 Claims**

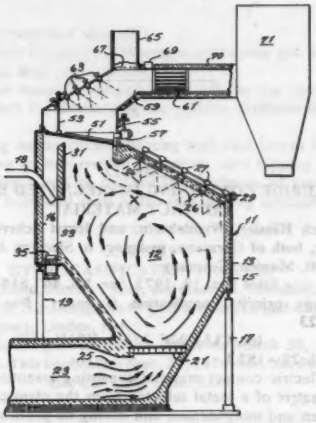
1. A flash reactor unit comprising in combination:

an enclosed housing defining a reaction chamber therein, said housing having walls formed of a refractory material to thereby isolate the high temperatures of the inside of said chamber from the ambient temperature of the outside thereof, at least two opposing side walls of said chamber being sloped away from one another from the bottom toward the top of said chamber, the lower portion of said chamber being relatively narrow and the upper portion thereof being relatively wide to thereby enhance the vertical circulation of gases and particulate matter in said chamber,

means for introducing a stream of hot, high velocity exhaust gases into said chamber proximate the bottom thereof and for directing said gases along one of said opposing side walls to force said gases upwardly within said chamber and then downwardly along the other of said opposing side walls,

means for spraying sanitary waste liquid into said chamber proximate the top thereof, said sanitary waste liquid including particulate matter dispersed therein,

means positioned remote from said exhaust introducing means for introducing metallic waste objects into said chamber, said hot gases continuously circulating said metallic objects substantially throughout said chamber thereby exposing substantially all of the surface area thereof to the chemicals of said gases and liquid waste, the surfaces of said metallic objects forming a reaction surface for generating insoluble salts from said hot gases and liquid waste,



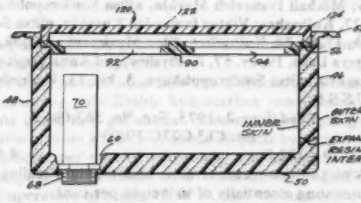
means for continuously conveying said metallic objects away from said chamber after reacting with said hot gases and sanitary waste, said conveying means including an open topped chute positioned on the side of said chamber opposite said one opposing side wall so that as said gases circulate in said chamber, said metallic waste objects are deflected into said chute and conveyed away from said chamber, and

means for exhausting said hot gases and insoluble salts from said chamber.

3,985,511
CONSTANT TEMPERATURE BATH FOR LABORATORY USE

Paul J. Betts, Muskegon, Mich., assignor to Inter Dyne, Spring Lake, Mich.

Filed Aug. 25, 1975, Ser. No. 607,227
Int. Cl.² A47J *27/10*; B01L *7/02*; F24H *1/00*
U.S. Cl. 23—292 **9 Claims**



1. A constant temperature bath for laboratory use containing a liquid and being capable of maintaining a laboratory container at a relatively constant temperature and possessing qualities of structural rigidity, relative low cost, and ease of manufacture, comprising:

a rigid, self-skinning resin foam, one-piece integrally molded tank, said tank having an open upper end, sides, and a bottom; and an inner and outer skin of closely packed reacted resin and an expanded reacted resin between said inner and outer skin;

liquid supply means connected to said tank for supplying a liquid;

overflow means disposed within said tank for allowing excess fluid to drain out of said tank without flowing over the top edge of the tank; and heating means disposed in said tank for heating a liquid and maintaining said liquid at a constant temperature.

3,985,512

TELLURIDE CONTAINING IMPREGNATED ELECTRIC CONTACT MATERIAL

Heinrich Hässler, Wendelstein, and Horst Schreiner, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 18, 1973, Ser. No. 407,618

Claims priority, application Germany, Nov. 8, 1972, 2254623

Int. Cl.² C22C *28/00*; H01H *1/02*

U.S. Cl. 29—182.1 **2 Claims**

1. Electric contact material consisting essentially of a porous matrix of a metal selected from the class consisting of tungsten and molybdenum and having its pores substantially impregnated with an impregnant selected from the class consisting essentially of an alloy of copper and copper telluride, copper telluride, an alloy of silver and silver telluride, silver telluride, an alloy of lead and lead telluride, and lead telluride.

3,985,513

NICKEL-BASE METAL-CERAMIC HEAT-RESISTANT SEALING MATERIAL

Alexandr Fedorovich Silaev, ulitsa Krasny Kazanets, 3, korpus 2, kv. 5; Raisa Stepanovna Matjushenko, 5 Kozhukhovskaya ulitsa, 9, kv. 21; Larisa Nikolaevna Popova, Bratskaya ulitsa, 23, korpus 1, kv. 107, all of Moscow; Vasily Alexandrovich Kurganov, ulitsa Simferopolskaya, 5, kv. 30, Kuibyshev; Mikhail Ivanovich Markin, ulitsa Simferopolskaya, 2, kv. 27, Kuibyshev; Viktor Ivanovich Kurakin, ulitsa Sergeya Lazo, 17, kv.28, Kuibyshev; Nina Maximovna Fatjuk, ulitsa Sergeya Lazo, 19, kv. 57, Kuibyshev, and Anna Kapitonovna Nazarova, ulitsa Simferopolskaya, 3, kv. 23, Kuibyshev, all of U.S.S.R.

Filed June 2, 1975, Ser. No. 583,091

Int. Cl.² C22C *29/00*

U.S. Cl. 29—182.5 **4 Claims**

1. A nickel-base metal-ceramic heat-resistant sealing material, consisting essentially of in weight per cent:

silicon dioxide,	from 0.5 to 8.0
boron nitride,	from 1.0 to 10.0
nickel,	the balance.

3,985,514

HOT ROLLED COMPOSITE BILLET FOR NUCLEAR CONTROL RODS

Gary E. Miller, Monroeville, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 468,971, May 13, 1974, Pat. No. 3,955,972, which is a division of Ser. No. 566,603, July 20, 1966, Pat. No. 3,827,264. This application Apr. 28, 1975, Ser. No. 572,239

Int. Cl.² B32B *15/18*

U.S. Cl. 29—187.5 **1 Claim**

1. A composite plate shaped billet comprising a core of stainless steel containing about 2% Boron 10, a thin coating of zirconia on the surfaces of said core, said core and said zirconia coating being completely encased in a jacket of mild steel, said composite having been hot rolled between about 1075° and about 1165° C.

3,985,515

METALLIZATION SYSTEM FOR SEMICONDUCTOR DEVICES, DEVICES UTILIZING SUCH METALLIZATION SYSTEM AND METHOD FOR MAKING DEVICES AND METALLIZATION SYSTEM

Richard L. Greeson, Scottsdale, and Elliott M. Philofsky, Phoenix, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 430,431, Jan. 3, 1974. This application Oct. 16, 1974, Ser. No. 515,280

Int. Cl.² B32B *15/20*

U.S. Cl. 29—195 **11 Claims**

1. A metallization system for contacting and bonding to a semiconductor surface comprising:

a first layer of aluminum deposited on the surface of said semiconductor, and

a second layer comprising a mixture of aluminum and tin codeposited on said first layer of aluminum.

3,985,516

COAL DRYING AND PASSIVATION PROCESS

Clarence A. Johnson, and William Volk, both of Princeton, N.J., assignors to Hydrocarbon Research, Inc., Morristown, N.J.

Filed Aug. 20, 1975, Ser. No. 606,256

Int. Cl.² C10L *9/00*; F26B *3/08*

U.S. Cl. 44—1 R **14 Claims**

1. A process for passivating particulate pyrophoric low rank coals containing at least 10% moisture by weight, in a vessel containing a drying zone and a sub-adjacent coating zone, comprising the steps of:

a. passing an inert gas upwardly through the coating zone and drying zone of the treating vessel, at a temperature sufficiently high to vaporize the moisture in the carbonaceous material but below the temperature at which the carbonaceous material will devolatilize, and at sufficient velocity to maintain the carbonaceous material in a fluidized condition in the coating zone;

b. feeding the particulate material to the drying zone of the treating vessel;

c. maintaining the particulate material in the drying zone for a period of between 2 and 15 minutes whereby the material is dried to less than about 5% by weight of moisture by the hot gas flowing from the coating zone to the drying zone;

d. passing the dried material to the particle coating zone;

e. introducing a heavy hydrocarbon liquid into the particle coating zone, whereby the dried material is substantially uniformly coated with between 0.5 and 5.0 wt.% hydrocarbon;

f. withdrawing a warm moisture containing gas from the upper portion of the drying zone;

g. withdrawing the coated material from the coating zone.

3,985,517

COAL PASSIVATION PROCESS

Clarence A. Johnson, Princeton, N.J., assignor to Hydrocarbon Research, Inc., Morristown, N.J.

Filed Aug. 20, 1975, Ser. No. 606,258
Int. Cl.² C10L 9/00; F26B 3/08
U.S. Cl. 44—1 R 11 Claims

1. A process for passivating particulate pyrophoric low rank coals, in a fluidized treating vessel, wherein the material is simultaneously dried and coated with a hydrocarbon liquid, thereby rendering the material substantially resistant to reabsorption of moisture and adaptable for storage and shipment at ambient temperatures, comprising the steps of:

a. feeding the material to the treating vessel;

b. drying the material with a hot inert gas, maintained at a temperature sufficient to vaporize the moisture without devolatilizing the particulate material, said inert gas being introduced below the material in the treating zone and maintained at sufficient velocity to form a fluidized bed;

c. introducing a heavy liquid hydrocarbon into the treating vessel;

d. substantially uniformly coating the material with between about 0.5 to 2.5 weight percent of a heavy hydrocarbon liquid;

e. removing an effluent gas stream consisting essentially of water and hydrocarbons from the vessel;

f. withdrawing the hydrocarbon coated particulate material from the treating vessel.

3,985,518

OXYGEN REFUSE CONVERTER

John Erling Anderson, Katonah, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 435,189, Jan. 21, 1974, abandoned, which is a continuation of Ser. No. 319,530, Dec. 29, 1972, Pat. No. 3,801,082. This application Dec. 20, 1974, Ser. No. 535,112
The portion of the term of this patent subsequent to Apr. 24, 1990, has been disclaimed.
Int. Cl.² C10J 3/02
U.S. Cl. 48—111 11 Claims

8. Apparatus for disposing of refuse by converting it to useful gaseous products and inert solid residue comprising in combination:

1. a vertical metal shaft providing a drying zone at the top section thereof, a hearth at the base section thereof, and a thermal decomposition zone between said drying zone and said hearth, the base section of said shaft being frusto-pyramidally shaped such that the cross-sectional area of said shaft tapers from a maximum at the thermal decomposition zone to progressively smaller values at said hearth,

2. means for feeding an oxygen-containing gas into said hearth,

3. vapor-tight means for feeding refuse into the top section of said shaft to form a refuse bed therein, the cross-sectional area of said shaft at the level of the top surface of said refuse bed being at lest equal to the value defined by he formula:

$$B = R\left[0.17 + 0.023\left(\frac{100-P}{P}\right)\right]$$

where:

B = cross-sectional area (ft²),

P = percent oxygen in said oxygen-containing gas, and

R = refuse feed rate (tons/day),

4. conduit means communicating with the top section of said shaft for discharging the gaseous products formed, and

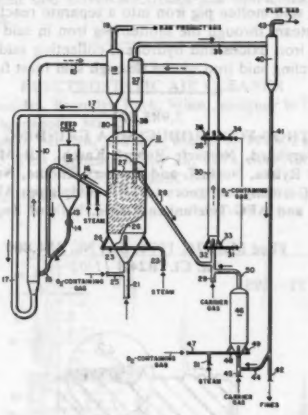
5. tapping means communicating with said hearth for discharging molten residue therefrom, said tapping means providing a seal to prevent the discharge of gases and vapors from said shaft to the surrounding atmosphere,.

3,985,519

HYDROGASIFICATION PROCESS

Theodore Kalina, Morris Plains, and Harry A. Marshall, Madison, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 238,895, March 28, 1972, abandoned. This application Sept. 27, 1974, Ser. No. 509,880
Int. Cl.² C10J 3/46, 3/54
U.S. Cl. 48—202 24 Claims



1. A process for the production of a methane-containing gas from coal which comprises:

suspending hot solid particles and carbonaceous coal solids containing volatilizable hydrocarbon constituents in dilute phase in a gas stream containing hydrogen gas in a ratio of from about 3 to about 20 parts by weight of said particles per part of said solids, said particles having a temperature in excess of a minimum hydrogasification temperature of about 1200° F., said carbonaceous solids having a temperature below said minimum hydrogasification temperature, and said particles containing sufficient available heat to raise the temperature of said carbonaceous solids to at least said minimum hydrogasification temperature;

passing said gas stream containing said particles and said carbonaceous solids through a transfer line hydrogasifier

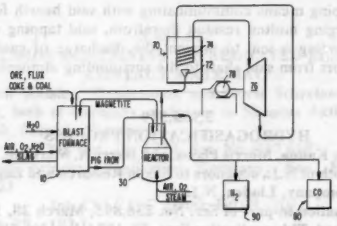
at a pressure of from about 40 to about 1000 psia, the residence time of said carbonaceous solids in said hydrogasifier being limited to a period sufficient for the devolatilization of said carbonaceous solids and for the conversion of from one to about 50 mol percent of the carbon in said carbonaceous solids into methane; and

withdrawing from said hydrogasifier a raw product gas containing methane produced within said hydrogasifier.

3,985,520
GASIFICATION PROCESS AND APPARATUS

Louis Gold, 2725 - 39th St., Northwest, Washington, D.C. 20007

Continuation-in-part of Ser. No. 355,400, April 30, 1973, abandoned. This application June 26, 1975, Ser. No. 590,743
Int. Cl.² C10J *3/00, 3/16*
U.S. Cl. 48—202 **10 Claims**

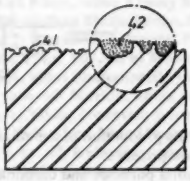


1. A process for the production of hydrogen comprising producing a quantity of molten pig iron in a blast furnace, charging said molten pig iron into a separate reaction vessel, passing steam through the molten pig iron in said reactor to produce iron oxides and hydrogen, collecting said hydrogen and recycling said iron oxides through said blast furnace.

3,985,521
METHOD FOR PRODUCING A GRINDING FOIL

Heinz Borchard, Nortorf; Robert Kasch, Alt Muhlendorf; Bruno Rybka, Nortorf, and Herbert Knothe, Neumunster, all of Germany, assignors to TED Bildplatten Aktiengesellschaft and AEG-Telefunken-Teldec, both of Zug, Switzerland

Filed Mar. 26, 1974, Ser. No. 454,800
Int. Cl.² B24D *11/02*
U.S. Cl. 51—295 **6 Claims**

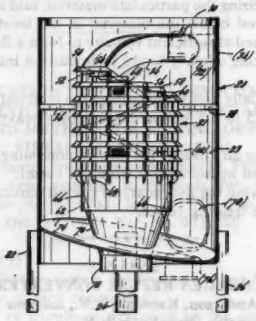


1. Method for producing a plastic grinding foil having a hard grinding agent constituted by diamond powder uniformly distributed in a layer at the surface of the foil for grinding cutting styli or pickups for information carriers, the foil being flexible and being constituted at least in the layer at such surface by a thermoplastically deformable material, comprising: providing the surface of the plastic foil with indentations whose depth is at least several times the maximum grain size of the grinding agent for accommodating the grinding agent by stamping the surface with a metal stamping matrix whose surface presents projections corresponding to such indentations; then filling the indentations with such grinding agent; and subsequently thermoplastically deforming such surface layer by subjecting the layer to a stamping operation by a matrix having a smooth surface for smoothing the surface and bonding the grinding agent into the surface layer.

3,985,522
METHOD AND APPARATUS FOR SEPARATING SOLID PARTICLES FROM A MIXED FLUID STREAM

Henry Kuhlmann, Bena, Va., assignor to Deepsea Ventures, Inc., Gloucester Point, Va.

Continuation-in-part of Ser. No. 148,253, May 25, 1971, abandoned. This application Feb. 13, 1973, Ser. No. 332,191
Int. Cl.² B01D *53/24*
U.S. Cl. 55—52 **10 Claims**



1. A method of separating solid ocean floor ore particles from a liquid in a three-phase foaming fluid, the method comprising: (a) discharging a stream of a three-phase foaming fluid, comprising water, gas and solid ocean floor ore particles contained therein, within a porous walled chamber in a downward direction substantially tangential to the interior surface of the chamber at the point of discharge; (b) downwardly guiding the discharge stream beginning at the time of discharge in a helical path around the inner surface of the chamber wall; (c) axially confining the solid particles within the chamber and permitting the discharge of the liquid and gas outwardly through the porous wall as the mixture is helically guided downwardly; and (d) recovering the solid particles from within the chamber after the liquid and gas are discharged.

3,985,523
POLLUTION CONTROL PROCESS FOR FERTILIZER PLANT

Philip F. Kaupas, Denville, and Dellason F. Bress, Murray Hill, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Continuation-in-part of Ser. No. 510,333, Sept. 30, 1974, abandoned. This application Feb. 13, 1976, Ser. No. 657,896
Int. Cl.² B01D *47/06*; C05C *9/00*
U.S. Cl. 55—70 **6 Claims**

1. In the manufacture of ammonium nitrate fertilizer including oxidation, absorption, neutralization, evaporation and solidification stages, the continuous process comprising the steps of:

A. passing a liquid stream of ammonium nitrate solution in heat exchange relation with a stream of water vapor containing ammonium nitrate components generated as a by-product during said neutralization stage of said manufacture of fertilizer to condense said water vapor stream and thereby produce a first heated contaminant stream of ammonium nitrate solution;

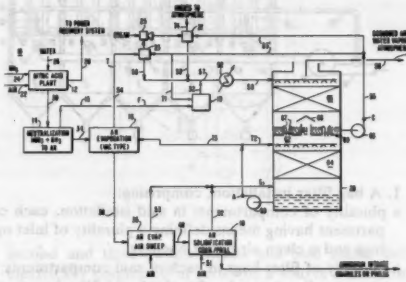
B. combining said first heated contaminant stream with a second contaminant stream containing a by-product gen-

erated during said evaporation stage to form a resultant liquid contaminant stream;

C. passing said resultant liquid contaminant stream into an upper direct contact zone, a first portion of said resultant liquid contaminant stream further passing to a lower direct contact zone;

D. passing a third contaminant stream of air and entrained solid particles of ammonium nitrate into said lower direct contact zone in direct contact heat exchange relation with said first portion of said resultant liquid contaminant stream, and dissolving a portion of said entrained solid ammonium nitrate particles into said first portion of said resultant liquid contaminant stream and evaporating a portion of water from said first portion of said resultant liquid contaminant stream thereby cooling said first portion of said resultant liquid contaminant stream and yielding a heated resultant gaseous contaminant stream;

E. passing said heated resultant gaseous contaminant stream into said upper direct contact zone for contact with said resultant liquid contaminant stream and dissolving an-



other portion of said entrained solid ammonium nitrate particles into said resultant liquid contaminant stream, and evaporating a portion of water from said resultant liquid contaminant stream, thereby cooling said resultant liquid contaminant stream and yielding a stream of substantially pure water vapor and air;

F. ejecting said stream of substantially pure water vapor and air from said upper direct contact zone;

G. recirculating a second portion of said resultant liquid contaminant stream to said evaporation stage of said manufacture of ammonium nitrate fertilizer, and a third portion of said resultant liquid contaminant stream to said neutralization stage of said manufacture of ammonium nitrate fertilizer;

H. recycling a part of said first portion of said resultant liquid contaminant stream from said lower direct contact zone to said evaporation stage of said manufacture of ammonium nitrate fertilizer; and

I. recirculating a remaining part of said first portion of said first contaminant stream from said lower direct contact zone to the top of said lower direct contact zone.

3,985,524

ELECTRIC DUST COLLECTOR APPARATUS

Senichi Masuda, 40-10-605, 1-chome, Nishigahara, Kita, Tokyo, Japan

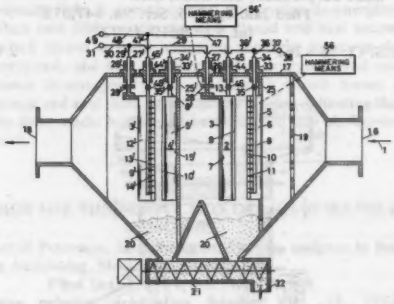
Filed Jan. 2, 1975, Ser. No. 538,093
Claims priority, application Japan, Jan. 4, 1974, 49-791
Int. Cl.² B03C *3/76*
U.S. Cl. 55—112 **11 Claims**

1. An electric dust collector apparatus comprising:

a body duct having gas inlet and outlet means;

a plurality of channel-shaped collector electrodes disposed in said body duct at equal intervals in parallel to each other along a plane transverse of a gas flow within said body duct, said channel-shaped collector electrodes having openings directed upstream;

a plurality of channel-shaped driver electrodes disposed in said body duct upstream of said collector electrodes at equal intervals along a plane transverse of the gas flow within said body duct and in staggered relationship to said respective collector electrodes, said driver electrodes positioned in parallel to each other and to said collector electrodes and insulated from said collector electrodes, said driver electrodes including openings directed to downstream;



a plurality of corona discharge electrodes disposed midway between adjacent ones of said driver electrodes in parallel thereto and opposed to inner surfaces of said collector electrodes in parallel thereto an insulated from both said driver and collector electrodes; and

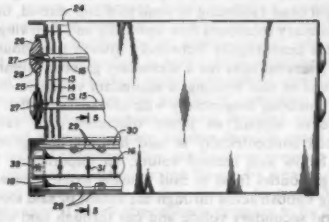
a D.C. high voltage source for applying a D.C. high voltage between said driver electrodes and said collector electrodes.

3,985,525

ELECTROSTATIC AIR CLEANER

Milos Tomaides, Brooklyn Park, Minn., assignor to Chemtool, Inc., Minneapolis, Minn.

Division of Ser. No. 338,605, March 6, 1973, Pat. No. 3,854,903. This application July 26, 1974, Ser. No. 492,251
Int. Cl.² B03C *3/00*
U.S. Cl. 55—138 **10 Claims**



1. An electronic air cleaning collector cell assembly consisting of alternate parallel collecting plates providing interleaved groups of different polarity, a plurality of aligned mounting holes and clearance holes in each group of collecting plates, spacing rods, said spacing rods having slots extending transversely partially therethrough at spaced intervals along the length thereof, said spacer rods extending through said mounting holes and being displaced with respect thereto to insert a portion of said plates of the same polarity into said slots to provide inter-plate spacing with said rod passing through said clearance holes in the interleaved plates of opposite polarity, side wall members, said side wall members having holes therethrough matching the location of said rods, means cooperating with said spacing rods and said holes in said side walls to abut

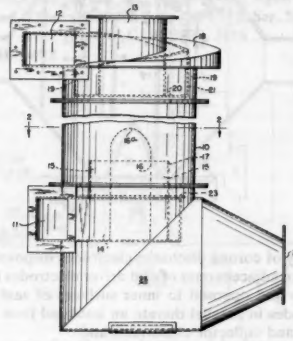
and secure the inside faces of said side wall against the ends of the spacer rods in contact with plates of one polarity and insulating means on said side panels to insulate said spacer rods in contact with plates of the opposite polarity from said side panels.

3,985,526

DUST COLLECTOR WITH SPACED VOLUTES

John F. Phillippi, Mentor, Ohio, assignor to Aerodyne Development Corporation, Cleveland, Ohio

Filed Jan. 8, 1976, Ser. No. 647,370
Int. Cl.² B01D 45/12
U.S. Cl. 55—261 **2 Claims**



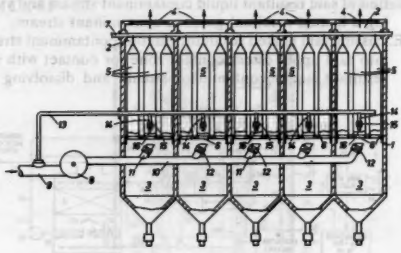
1. Apparatus for collecting finely divided particles contained in a gaseous medium comprising an elongated cylindrical housing closed except for inlets and outlets specifically defined herein, there being an inlet for primary flow of a contaminated gas stream near one end of said housing, a primary volute in said housing communicating smoothly with said inlet, a cylindrical cup shroud mounted in said housing axially of said housing and generally centrally of said volute, means closing the bottom of said volute, said volute at its top being open to said shroud but closed at its top outside of said shroud, a filler member fixed axially of said cup shroud and closing the central portion thereof from the bottom of said volute to the top of said cup shroud and having a generally elliptical head extending beyond said cup shroud, thus providing a primary rotational flow upwardly and throwing entrained particles centrifugally outwardly toward said housing, there being a second inlet for a secondary gaseous stream near the other end of said housing, a secondary volute in said housing communicating tangentially with said second inlet, a cylindrical sleeve shroud of lesser diameter than said housing mounted concentrically in said housing and generally centrally below said second volute, an imperforate cylindrical clean gas outlet fixed in said housing axially thereof and extending unobstructed through the extent of said sleeve shroud and said secondary volute and out through said other end of said housing, said sleeve shroud spaced from the wall of said housing and there providing an annular passageway between said sleeve and said housing, said secondary volute at the top being closed outside of said gas outlet, said secondary volute at its bottom being open at said annular passageway between said sleeve shroud and said housing and being otherwise closed, there being means closing the space between said gas outlet and said sleeve shroud at the bottom of said sleeve shroud, thus providing a secondary rotational flow downwardly directed by said sleeve shroud adjacent the inner wall of said housing and carrying any separated particles there downwardly, a solid ground provided as an annular ring at right angles to the axis of said housing at about the bottom of said cup shroud and extending outwardly therefrom to a zone spaced from the wall of said housing and there leaving an annular discharge opening for the dropping of separated particles downwardly, and a sump associated with said housing beneath said discharge opening.

3,985,527

BAG FILTER INSTALLATION

Douglas James Smithson, Sheffield, England, assignor to British Steel Corporation, London, England

Filed Apr. 3, 1975, Ser. No. 564,800
Claims priority, application United Kingdom, Apr. 10, 1974, 15930/74
Int. Cl.² B01D 46/02
U.S. Cl. 55—341 R **4 Claims**



1. A bag filter installation, comprising:
a plurality of compartments in said istallation, each compartment having means defining a plurality of inlet openings and a clean air outlet opening;
a plurality of filter bags in each of said compartments;
means coupling one side of each of said filter bags in each of said compartment to a respective one of said inlet openings;
a main flow duct;
means operably connecting said main flow duct with said one side of the filter bags in each of said compartments;
a fan mounted in said main flow duct for conveying gases in the main flow duct to each of said filter bags;
manifold means connected to each of said compartments on the other side of said filter bags and to the main flow duct on the suction side of the fan;
hose coupling means in each of said compartments;
duct means connecting said coupling means in each of said compartments to the respective manifold means; and
a valve in each of said duct means by which the corresponding duct may be selectibly connected to the suction side of the fan whereby the fan suction is utilizable for cleaning local areas in the selected compartment through the hose coupling.

3,985,528

CONTROL MEANS AND AUTOMATIC ROLL-TYPE FILTER

Alan E. Revell, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 376,672, July 5, 1973, abandoned. This application Jan. 24, 1975, Ser. No. 543,941
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² B01D 46/18
U.S. Cl. 55—352 **3 Claims**

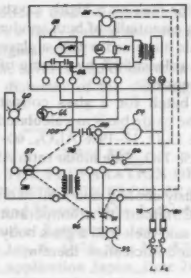
1. An air filtering apparatus comprising: a filter media supply roll to receive a roll of filter media; a filter media take-up roll to receive filter media from said supply roll; an air filtering zone disposed between said supply roll and said take-up roll; filter media extending from said media supply roll through said air filtering zone to said filter media take-up roll, so air can be treated passes through said filter media in said air filter

zone; and an adjustable, fail-safe air filter media advanced control system responsive to a reduction in the light transmitting quality of said media, said filter media advanced control system comprising:

an electric light source of controlled intensity disposed on one side of said filter media and electrically connected to a source of electrical energy, and a photocell disposed on the opposite side of said filter media from said light source and connected to a source of electrical energy;

an electric motor drivingly connected to said take-up roll to effect the advance of said media;

an energizing circuit to energize said motor to drive said take-up roll, said energizing circuit including normally open first switch means, normally open second switch means, and normally open third switch means, said first,



second and third switch means and said motor being electrically connected in series to a source of electrical energy, and said second switch means being also connected in electrical series to said light source;

a warning light electrically connected to a source of electrical energy;

fourth switch means electrically connected in series with said warning light to the source of electrical energy;

fifth switch means electrically connected to said warning light and parallel to said fourth switch means;

a rheostat electrically connected in series with said photocell and in parallel to said first switch means, said rheostat enables a resistance value to be preselected which when exceeded by the resistance of said photocell initiates activation of said first switch means to energize said motor to drive said take-up roll;

a resistor electrically connected in series with said rheostat and said photocell, said resistor being of sufficient value to prevent said rheostat from being adjusted to such a low resistance value that said first switch means is activated to advance said media when clean media is present in said air filtering zone;

first relay means electrically connected to said first switch means for activating said first switch means, said first relay means being electrically connected to said photocell and parallel with said rheostat and said resistor to close said first switch means when the resistance of said photocell exceeds the resistance of said rheostat due to the quantity of light received by said photocell falling below a first predetermined value;

second relay means electrically connected to said second and fifth switch means for activating said second and fifth switch means, said second relay means being electrically connected in series with said light source to close said second switch means and open said fifth switch means when said light source is energized; and,

third relay means electrically connected to said third and fourth switch means, said third relay means being electrically connected to said photocell in series with said rheostat and said resistor and in parallel with said first relay means, said third relay means has less resistance than said first relay means, said third relay means to close said third switch means and open said fourth switch means when the resistance of said photocell exceeds the resistance of said third switch means and is less than the resistance of said rheostat and said resistor due to the quantity of light received by said photocell falling below a second predetermined value, said second predetermined value being higher than said first predetermined value,

whereby said motor is energized when said first, second and third switch means are each in a closed position, said warning light is energized and said motor de-energized when said fifth switch means is closed and said second switch means is open indicating the light source is de-energized, and said warning light is energized and said motor de-energized when said fourth switch means is closed and said third switch means is open indicating that the filter media has been exhausted from said air filtering zone.

3,985,529

METHOD FOR THE PRODUCTION OF LIQUID SULPHUR DIOXIDE

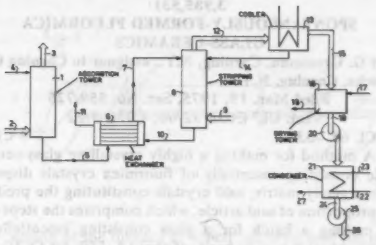
Stig Arvid Petersson, Skelleftehamn, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Oct. 7, 1974, Ser. No. 512,948

Claims priority, application Sweden, Oct. 15, 1973, 7313965

Int. Cl.² F25J *3/08*

U.S. Cl. 62—17 **8 Claims**



1. The method of recovering liquid sulphur dioxide from combustion gases containing sulphur dioxide comprising washing the gas with water in an absorption plant, so that the sulphur dioxide is absorbed by the washing water, introducing steam and said SO_2 absorbed in water into a stripping column maintained at a first pressure below atmospheric pressure and at a temperature between 15° and 98° C. whereby absorbed sulphur dioxide which contains water is stripped, cooling the steam treated watercontaining sulphur dioxide gas which is moist at a second pressure below atmospheric pressure so that the water condenses, further drying the gas by means of sulfuric acid, and liquefying the sulphur dioxide by condensing in a heat exchanger at below atmospheric pressure to further dry said gas, said first and second pressures being controlled by pumping off the residual gases after sulphur dioxide condensation.

3,985,530

PRODUCTION OF GLASS FIBERS

William Christie Hynd, Lymm, England, assignor to Pilkington Brothers Limited, Merseyside, England

Filed May 2, 1975, Ser. No. 574,143

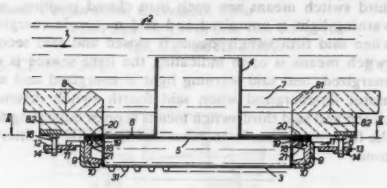
Claims priority, application United Kingdom, May 13, 1974, 21116/74

Int. Cl.² C03B *37/02*

U.S. Cl. 65—1 **12 Claims**

1. An apparatus for the production of glass fibres by attenuation of glass streams flowing from a bushing, comprising at

least one bushing arranged beneath an opening in the floor of a fore-hearth along which molten glass is fed from a glass melting furnace, wherein a plate extends across the opening at or near the bottom thereof, and forms a cover for the bushing, said cover plate thereby preventing flow of molten glass from within said opening to said bushing, said cover plate being formed with an aperture and carrying an upwardly extending duct spaced from the parts of the fore-hearth which surround



and define the opening in the floor, said duct connecting the aperture in the cover plate to a position in the fore-hearth above the floor and below the normal surface level of the molten glass, so that molten glass flows to the bushing through the duct and aperture from the said position above the floor of the fore-hearth, while the walls of the duct are kept hot by contact with molten glass in the opening above the cover plate.

3,985,531
SPONTANEOUSLY-FORMED FLUORMICA GLASS-CERAMICS

David G. Grossman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,725
Int. Cl.² C03B 32/00; C03C 3/22
U.S. Cl. 65—33 **3 Claims**

1. A method for making a highly crystalline glass-ceramic article consisting essentially of fluormica crystals dispersed within a glassy matrix, said crystals constituting the predominant proportion of said article, which comprises the steps of:
   a. melting a batch for a glass consisting essentially, by weight on the oxide basis, of about 5–15% Na_2O, 10–20% MgO, 65–75% SiO_2, and 5–10% F;
   b. simultaneously cooling said melt at a rate between about 10°–1000°C./minute to a temperature about 850°–1000°C. to shape said melt into a glass body and secure phase separation and nucleation therein;
   c. further cooling said shaped glass body and exposing said glass body to a temperature between about 650°–850° C. for a sufficient length of time to cause crystallization of the fluormica phase in said glass body; and then
   d. cooling the crystallized body to room temperature.

3,985,532
SPONTANEOUSLY-FORMED CELSIAN GLASS-CERAMICS

David G. Grossman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,726
Int. Cl.² C03B 32/00; C03C 3/22
U.S. Cl. 65—33 **3 Claims**

1. A method for making a highly crystalline glass-ceramic article consisting essentially of celsian and rutile crystals dispersed within a glassy matrix, said crystals constituting at least 50% by volume of said article, which comprises the steps of:
   a. melting a batch for a glass consisting essentially, by weight on the oxide basis as calculated from the batch, of about 25–45% BaO, 15–30% Al_2O_3, 20–40% SiO_2, 3–15% F, and 4–15% TiO_2;
   b. simultaneously cooling said melt at a rate between about 10°–1000° C./minute to a temperature about 850°–1050° C. to shape said melt into a glass body and obtain phase separation and nucleation therein;
   c. further cooling said shaped glass body and exposing said glass body to a temperature between about 650°–850° C. for a sufficient length of time to cause crystallization of the celsian and rutile crystals in said glass body; and then
   d. cooling the crystallized body to room temperature.

3,985,533
SPONTANEOUSLY-FORMED BETA-SPODUMENE GLASS-CERAMICS

David G. Grossman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,727
Int. Cl.² C03B 32/00; C03C 3/22
U.S. Cl. 65—33 **3 Claims**

1. A method for making a highly crystalline glass-ceramic article consisting essentially of beta-spodumene solid solution and rutile crystals dispersed within a glassy matrix, said crystals constituting at least 50% by volume of said article, which comprises the steps of:
   a. melting a batch for a glass consisting essentially, by weight on the oxide basis as calculated from the batch, of about 4–7% Li_2O, 12–19% Al_2O_3, 60–70% SiO_2, 0.5–5% F, and 5–12% TiO_2, the molar ratio Al_2O_3:Li_2O being less than one;
   b. simultaneously cooling said melt at a rate between about 10°–1000° C./minute to a temperature about 750°–900° C. to shape said melt into a glass body and obtain a phase separation and nucleation therein;

3,985,534
SPONTANEOUSLY-FORMED FLUORMICA GLASS-CERAMICS

James E. Flannery, and Dale R. Wexell, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,732
Int. Cl.² C03B 32/00; C03C 3/22
U.S. Cl. 65—33 **3 Claims**

1. A method for making a highly crystalline glass-ceramic article consisting essentially of fluormica crystals dispersed within a glassy matrix, said crystals constituting at least 50% by volume of said article, which comprises the steps of:
   a. melting a batch for a glass consisting essentially, by weight on the oxide basis as calculated from the batch, of about 1–5% Li_2O, 3–6% Na_2O, 2–6% Al_2O_3, 45–75% SiO_2, 3–7% F, and 5–10% B_2O_3 and/or 1.5–4.5% MoO_3 and/or WO_3;
   b. simultaneously cooling said melt at a rate between about 10°–1000° C./minute to a temperature about 875°–1050° C. to shape said melt into a glass body and obtain phase separation and nucleation therein;
   c. further cooling said shaped glass body and exposing said glass body to a temperature between about 750°–950° C. for a sufficient length of time to cause crystallization of the fluormica crystals in said glass body; and then
   d. cooling the crystallized body to room temperature.

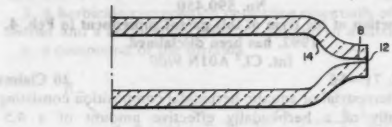
3,985,535
METHOD OF MAKING GLASS AMPUL FOR JET INJECTOR

Russell B. Bennett, Worthington; Clair E. Campbell, and Howard B. Pritz, both of Columbus, all of Ohio, assignors to SmithKline Corporation, Philadelphia, Pa.

Filed June 19, 1975, Ser. No. 588,300
Int. Cl.² C03C 19/00
U.S. Cl. 65—61 **6 Claims**

4. The method of forming a glass jet injector ampul having a body open at one end and having a restricted discharge passage at the other end with a discharge opening of a diameter of from about 0.007 to about 0.03 cm comprising:

drawing an aluminisilicate glass tube containing alkali metal ions and having the inner and outer diameter desired for the body of the ampul to provide a major reduction in the diameter of a portion of the tube to provide a portion having an inner diameter smaller then a predetermined inner diameter in the range of from about 0.007 to about 0.03 cm.,



severing the reduced diameter portion of the tube to form an ampul with a body having the inner and outer diameters of the original tube,

grinding back the severed end of the tube until the predetermined inner diameter of the discharge opening is provided.

3,985,536

METHOD FOR THE PREPARATION OF AN ORGANIC SOIL CONDITIONER FROM PEAT-MOSS

Ryonosuke Abbe, and Motoko Abbe, both of 92-5, Miharu-cho 5-chome, Yokosuka, Kanagawa, Japan

Filed Jan. 6, 1975, Ser. No. 538,810
Claims priority, application Japan, June 24, 1974, 49-71369
Int. Cl.² C05F 11/02
U.S. Cl. 71—24 **23 Claims**

1. A process for preparing an organic soil conditioner, which comprises the steps of:

agitating, at a temperature of less than 80° C, a reaction mixture consisting essentially of peat moss and an aqueous solution of a strong alkali in an amount equivalent to form 3 to 10% by weight, calculated as Na_2O, based on water-free peat moss, for a period of time not more than 30 minutes effective to form an aqueous alkaline extract of said peat moss and filtering said reaction mixture to remove non-dissolved substances therefrom whereby to recover a filtrate consisting of said aqueous alkaline extract;

adding to said filtrate an aqueous solution of an alkaline earth metal salt to substantially neutralize said filtrate whereby to form water-insoluble fine flocs of alkaline earth metal salts of the constituents of said extract, then adding to and mixing with the thus-treated filtrate an organic coagulant for said flocs whereby to coagulate said flocs;

then filtering the coagulated flocs from said filtrate and drying said coagulated flocs to obtain a particulate material useful as an organic soil conditioner.

3,985,537

PROCESS FOR MAKING CALCINED ALKALI PHOSPHATES OF HIGH CITRATE SOLUBILITY FOR USE AS FERTILIZERS

Ulrich Hauschild; Rudolf Holst, both of Hannover; Hans-Heinz Kaspers, Pattensen, and Heinrich Rotger, Ronnenberg, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Continuation of Ser. No. 259,851, June 5, 1972, abandoned.
This application Aug. 7, 1974, Ser. No. 495,522
Claims priority, application Germany, June 5, 1971, 2128133
Int. Cl.² C05B 13/06
U.S. Cl. 71—34 **6 Claims**

1. In a process for the continuous production of a fertilizer containing a calcium alkali-metal phosphate that has a high solubility in Petermann ammoniacal ammonium citrate solution from a naturally occurring calcium phosphate containing tricalcium phosphate by thermal decomposition of a mixture consisting essentially of the naturally occurring calcium phosphate, silica acid and an alkali-metal hydroxide of the group consisting of sodium hydroxide and potassium hydroxide at a temperature between approximately 900° and 1300°C in a rotary furnace that is heated by means of a direct flame burner in the region of its discharge outlet, the improvement which comprises

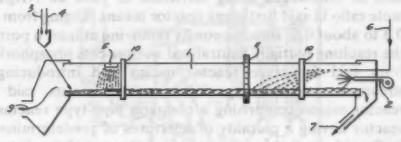
a. continuously charging a mixture of solids consisting essentially of silicic acid and a naturally occurring calcium phosphate into the rotary furnace at its inlet,

b. passing the said mixture of solids through the furnace from its inlet to its discharge outlet at such a rate that at least a substantial portion thereof is converted into the desired fertilizer containing a calcium alkali-metal phosphate,

c. passing the flue gases from the burner to the furnace countercurrently to the flow of the mixture of solids therethrough,

d. maintaining the temperature of the solids within the furnace at gradually increasing temperatures from the inlet of the furnace to a maximum temperature between 900° and 1300°C at the discharge outlet of the furnace by means of the burner and the flue gases passing through the furnace,

e. continuously charging the alkali-metal hydroxide in the form of an aqueous solution containing between 30 and 80% by weight of the alkali-metal hydroxide into the



region of the furnace at which calcination of the mixture has started, or into an immediately preceding region in which the mixture of solids has reached temperature of at least 400°C, and in such manner that the water in the solution is rapidly vaporized an the mixture is homogenized by the rotary motion of the furnace, the said alkali-metal hyroxide solution being charged at a rate such that at least 1.1 and at most 1.5 mols of alkali-metal oxide (calculated as Me_2O in which Me represents Na or K) is supplied for each mol of phosphorus pentoxide (P_2O_5) that is present in the mixture of solids that is being charged into the furnace,

f. maintaining the concentration of the silicic acid (SiO_2) in the mixture of solids at such a level that substantially all of the tricalcium phosphate that is present in the mixture is converted to a calcium orthosilicate ($2\,CaO \cdot SiO_2$) and calcium alkali-metal phosphate ($Me_2O \cdot 2\,CaO \cdot P_2O_5$) in accordance with the following equation:

$$2\,Ca_3(PO_4)_2 + SiO_2 + 4\,MeOH \rightarrow 2(Me_2O \cdot 2CaO \cdot P_2O_5) + (2CaO \cdot SiO_2) + 2H_2O$$

and other phosphate-free calcium compounds that are present in the mixture of solids are converted to calcium orthosilicate in accordance with the following equation:

$$2CaO + SiO_2 \rightarrow (2CaO \cdot SiO_2)$$

g. and recovering the resulting mixture of solids containing the calcium alkali-metal phosphate at the discharge outlet of the furnace.

3,985,538

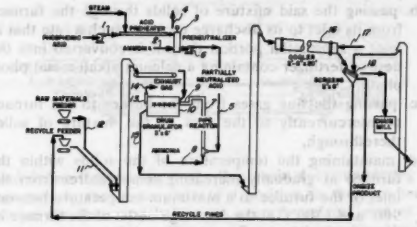
PIPE REACTOR-CONTINUOUS AMMONIATOR PROCESS FOR PRODUCTION OF GRANULAR PHOSPHATES

Gordon C. Hicks, Sheffield, and Fred E. Lancaster, Jr., Killen, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. Legol, Jr., Oct. 24, 1974, now Defensive Publication No. T940023. This application May 16, 1975, Ser. No. 578,118

Int. Cl.[2] C05B 7/00; B01D 1/16

U.S. Cl. 71—34 6 Claims



1. An improved process for the granulation of mixed fertilizers comprising the steps of introducing a stream of commercial-grade wet-process phosphoric acid containing from about 50 percent to about 58 percent P_2O_5 into first-stage reactor means; simultaneously introducing a stream of ammonia into said first reactor means, the proportioning of ammonia and acid so introduced being sufficient to yield an NH_3:H_3PO_4 mole ratio in said first-stage reactor means ranging from about 0.3 to about 0.5; simultaneously removing at least a portion of the resulting partially neutralized wet-process phosphoric acid from said first-stage reactor means and introducing said stream into second-stage inline reactor means, said inline reactor means comprising a common pipe-type reactor, said reactor having a plurality of apertures of predetermined size in the side wall thereof juxtaposed the end thereof; simultaneously introducing a second stream of ammonia into said inline reactor means in quantities sufficient to maintain therein a mole ratio of NH_3:H_2PO_4 in the range from about 0.9 to about 1.2; contacting said partially neutralized wet-process acid with said second stream of ammonia in said common pipe reactor at about atmospheric pressure and forming at temperatures in the range of about 400° F to about 500° F in said inline reactor means a resulting melt of ammonium phosphate containing from about 5 to about 50 percent of the P_2O_5 values therein as polyphosphate; atomizing said melt with expanding water vapor formed by heat of said ammoniation reaction in said inline reactor means and removing at least a portion of said ammonium phosphate melt through said plurality of apertures of predetermined size in the side wall of said inline reactor; spraying said atomized ammonium phosphate melt, by means of the reaction steam pressure, into the upper end of an inclined rotating drum and onto a bed of moving particles maintained therein; simultaneously introducing particles of recycled fines from a later-mentioned sizing step into said rotary drum at the upper end thereof for contact with said ammonium phosphate melt; withdrawing the resulting ammonium phosphate material from the lower end of said drum; introducing said withdrawn material into cooling means; withdrawing the resulting cooled material from said cooling means; introducing said material withdrawn from said cooling means into sizing means; returning particles of predetermined size from said sizing means into the upper end of said drum and withdrawing from said sizing means granular particles of ammonium phosphate as product, said process characterized by the fact that there is substantially no change in the moisture content of said ammonium phosphate between said step of removing same from the lower end of said drum to the recovery of same as product.

3,985,539

4,5-DIHALOPYRROLE-2-CARBONITRILE-CONTAINING TERRESTRIAL AND AQUATIC HEBICIDAL COMPOSITION

Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

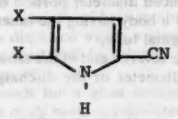
Division of Ser. No. 443,740, Feb. 19, 1974, Pat. No. 3,932,458, which is a division of Ser. No. 195,817, Nov. 4, 1971, Pat. No. 3,864,491. This application June 26, 1975, Ser. No. 590,450

The portion of the term of this patent subsequent to Feb. 4, 1992, has been disclaimed.

Int. Cl.[2] A01N 9/00

U.S. Cl. 71—66 20 Claims

1. A terrestrial or aquatic herbicidal composition consisting essentially of a herbicidally effective amount of a 4,5-dihalopyrrole-2-carbonitrile having the formula



where X is chlorine, bromine or iodine as the active ingredient applied at a terrestrial herbicidal concentration of 1.0 to 8.0 pounds per acre and at an aquatic herbicidal concentration of from 1.0 to 40 parts per million and a conventional carrier especially adapting the composition as a whole to application to areas to be cleared of undesirable terrestrial or aquatic plant growth.

3,985,540

METAL COMPLEXES OF HYDROXYQUINOLINE AND POLYMERIC POROUS GRANULES

Marvin M. Fein, Westfield, N.J.; Nathan D. Field, Allentown, and Earl P. Williams, Pen Argyl, both of Pa., assignors to GAF Corporation, New York, N.Y.

Filed Apr. 2, 1970, Ser. No. 25,290

Int. Cl.[2] A01N 5/00

U.S. Cl. 71—67 12 Claims

1. A complex formed by reacting 8-hydroxyquinoline and a water-insoluble but water swellable cross-linked polymer selected from the group consisting of N-vinyllactam or N-alkyl-N-vinylamide monomers, said polymer being in the form of porous beads or granules, to form a complex therebetween and thereafter reacting said complex with a metallic salt to form a complex between the metallic salt and said polymer complex.

3,985,541

PLANT GROWTH REGULATORS AND PROCESS OF REGULATING PLANT GROWTH

Johann Glasl, Solingen; Günter Kreienfeld, Dusseldorf-Holthausen, and Hermann Kroke, Erkrath-Unterbach, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Oct. 16, 1974, Ser. No. 515,417

Claims priority, application Germany, Nov. 3, 1973, 2355027

Int. Cl.[2] A01N 9/24

U.S. Cl. 71—78 8 Claims

1. An at least water-emulsifiable plant growth regulator for inhibiting the growth of sucker shoots of tobacco plants, consisting of fatty acid polyoxyethylene glycol ester mixtures obtained by ethoxylating fatty acids having from 6 to 12 carbon atoms with from 4 to 8 mols of ethylene oxide per mol of fatty acid, said mixtures consisting of about 45% to 55% by weight of fatty acid polyoxyethylene glycol monoesters, about 25% to 35% by weight of fatty acid polyoxyethylene glycol diesters and about 15% to 25% of free polyoxyethylene glycol.

3,985,542

HERBICIDE

Adolf Fischer, Mutterstadt, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Oct. 3, 1974, Ser. No. 511,942

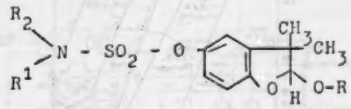
Claims priority, application Germany, Oct. 19, 1973, 2352537

Int. Cl.² A01N 9/00

U.S. Cl. 71—88 **10 Claims**

1. A herbicide composition consisting essentially of an inert carrier and a herbicidally effective amount of a mixture of

a. a compound of the formula



where R is methyl, ethyl, propyl, isopropyl, allyl or propargyl, R^1 is methyl and R^2 is hydrogen or methyl, and

b. 1-phenyl-4-amino-5-chloropyridazone-(6) in a weight ratio of a to b in the range of 3:1 to 1:3.

3,985,543

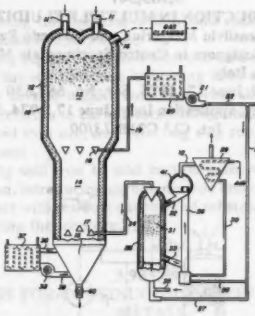
METHOD FOR CARBONIZING AND DESULFURIZING CARBON

Joseph Vlnaty, Aliquippa; George A. Snyder, Bradford Woods, and John A. Anthes, Rosslyn Farms, all of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 240,399, April 4, 1972, abandoned. This application Jan. 8, 1975, Ser. No. 539,522

Int. Cl.² C22B 1/08

U.S. Cl. 75—3 **9 Claims**



1. The continuous process of desulfurizing and carbonizing formcoke compacts in a reactor through which the compacts together with a finely divided sulfur acceptor pass wherein:

a. the reactor is a vertical shaft furnace having an uppermost preheat zone and a lowermost exit zone and the compacts and a finely-divided sulfur acceptor move downwardly together from a common first place of introduction of the compacts and sulfur acceptor in the said preheat zone in a continuous progression toward a place immediately ahead of said exit zone where highly-heated hydrogen-containing non-oxidizing gas is continuously supplied to the reactor to heat the interior thereof with the compacts and sulfur acceptor moving counter-current to the hot gas through a continuously-increasing temperature gradient from said preheat zone toward the place where the highly-heated hydrogen gas enters the reactor and thereafter enter the exit zone,

b. withdrawing a portion of the gases moving through the reactor at a level intermediate the preheat zone and the place of introduction of the highly-heated hydrogen-containing gas,

c. burning a portion of the gas so removed in a heat exchanger in which the heat of the gas so burned is used to heat the other portion of the gas so withdrawn, and utilizing the gas so heated to provide the said highly heated gas which is introduced into the reactor,

d. circulating that portion of the gases moving upwardly through the reactor which is not so removed at said intermediate level through the mixture of compacts and sulfur acceptor in the preheat zone to initially heat said mixture and thereafter removing said portion of the gases from the preheat zone; and

e. removing the compacts and solid sulfur acceptor from the reactor through the exit zone at the lowermost end of the reactor.

3,985,544

METHOD FOR SIMULTANEOUS COMBINED PRODUCTION OF ELECTRICAL ENERGY AND CRUDE IRON

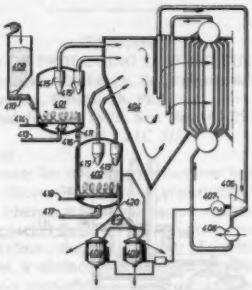
Per Harald Collin, Falun, and Folke Karl Evald Johansson, Borlange, both of Sweden, assignors to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden

Continuation-in-part of Ser. No. 299,213, Oct. 10, 1972, abandoned. This application July 31, 1974, Ser. No. 493,614

Claims priority, application Sweden, Nov. 1, 1971, 13891/71; Apr. 5, 1972, 4352/72; Apr. 21, 1972, 5211/72

Int. Cl.² C21C 5/52

U.S. Cl. 75—11 **6 Claims**



1. A method for simultaneous, combined producton of electrical energy and crude iron from carbonaceous material and grained material containing iron oxides comprising

performing reduction of the iron oxide in two separate operations, pre- and final reduction, the temperature being kept below the melting point of the crude iron during the

pre-reduction and above said melting point during the final reduction

introducing carbonaceous material and the material containing iron oxides into a fluidized bed containing solid carbonaceous material, producing reducing gases in the fluidized bed by partial combustion of the carbonaceous material with air/or oxygen gas, pre-reducing the iron oxides by said reducing gases until the material has achieved a metallizaton degree of 30–80 %, most of the heat requirement of the pre-reducton being covered by said combustion

finally reducing and smelting the product pre-reduced to a metallization degree of 30 to 80 % as defined above in the said pre-reduction operation to produce crude iron by mixing it with molten high-carbon crude iron, and heating electrically said molten high-carbon crude iron so as to substantially cover the heat required for said final reduction

conveying to a substantial extent the exhaust gases from the reduction operations directly to a thermal power station where the remaining energy contents (physical + chemical) of the gases are used to generate electric energy by utilizing the heat of the gases and by burning the combustible gases.

3,985,545

METAL MELTING METHOD USING ELECTRIC ARC FURNACE

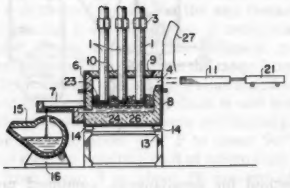
Sadamu Kinoshita, 389, 7-chome, Ohzumachi, Hiroshima, Japan

Division of Ser. No. 323,129, Jan. 12, 1973, Pat. No. 3,876,257, which is a continuation-in-part of Ser. No. 122,463, March 9, 1971, abandoned. This application Jan. 21, 1975, Ser. No. 542,811

Claims priority, application Japan, Sept. 24, 1970, 45-83233; Sept. 24, 1970, 45-83234

Int. Cl.² C21C *5/52*

U.S. Cl. 75—12 **2 Claims**



1. A method of melting and refining cast iron in an electric arc furnace of the closed type comprising the steps of:

generating an electric arc in said furnace using suitable electrodes;

charging raw materials into said furnace, said charging being accomplished so that said raw materials form heaps around said electrodes and cover said arc;

maintaining a reductive atmosphere and a positive pressure in said furnace using gas generated within said furnace;

melting said heaped raw materials so that fresh raw materials slide down, section by section, into said arc to be melted into drops of molten metal;

forming a layer of slag from a basic material having a melting point higher than that of the molten metal;

removing oxygen and sulfur from said molten metal by passing said drops of molten metal through said layer of slag; and

continuously tapping said molten metal after passage through said layer of slag.

3,985,546

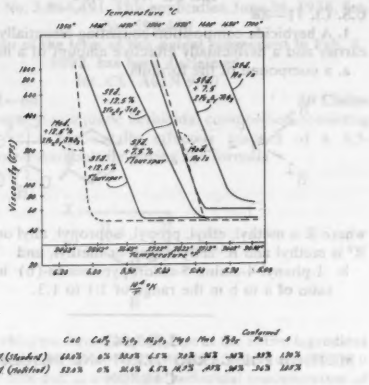
METHOD OF FLUIDIZING ACID CUPOLA SLAG

Robert Mrdjenovich, Trenton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1974, Ser. No. 535,546

Int. Cl.² C21B *5/04*

U.S. Cl. 75—30 **4 Claims**



1. A method of fluxing and fluidizing a slag in an acid operated cupola, to produce grey cast iron by adding to the cupola charge an effective amount of fluxing composition comprising, by weight relative to the metal charge, from 1.5–3.5% limestone or dolomitic limestone and 0.5–1.5% $2Fe_xO_y \cdot TiO_2$.

3,985,547

IRON ORE REDUCTION IN MULTIPLE FLUIDIZED BEDS

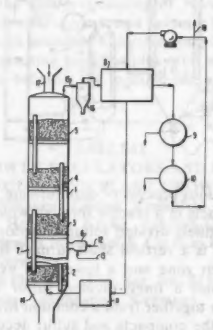
Italo Iacotti; Giansilvio Malgarini, and Edoardo Pasero, all of Rome, Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed June 17, 1975, Ser. No. 587,630

Claims priority, application Italy, June 17, 1974, 51566/74

Int. Cl.² C21B *13/00*

U.S. Cl. 75—35 **5 Claims**



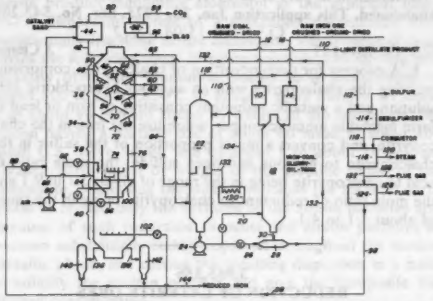
1. A process for the reduction of iron ore in a multistage fluid bed reactor in which a plurality of beds of iron ore are fluidized by passing reducing gases upwardly from the last bed to the first bed, while the iron ore passes from the first bed to the last bed, comprising producing a first portion of said reducing gases by partially combusting methane with a substoichiometric quantity of oxygen, introducing said first portion between said first and last beds, producing a second portion of said reducing gases by removing gas from said first bed, stripping CO_2 and H_2O from said second portion, and intro-

ducing into said last bed a fluidizing gas consisting essentially of only said stripped second portion.

3,985,548
DIRECT METAL REDUCTION FROM COAL

Lawrence Earl Leas, Simi, Calif.; Robert Lamar Leas, and Arnold Marcel Leas, both of Columbia City, Ind., assignors to Leas Brothers Development Corporation, Columbia City, Ind.

Filed May 30, 1972, Ser. No. 257,738
Int. Cl. C21b *13/02*
U.S. Cl. 75—36 **7 Claims**



1. A method for simultaneously recovering fuel liquids and gases from coal and using the recovered gases for reducing iron ore comprising the steps of

forming a slurry of crushed coal, oil and iron ore;

introducing said slurry into the top of a multi-stage vertical reactor tower separated into a top, middle and a bottom zone;

maintaining the pressure within said reactor tower at approximately 350 p.s.i.a.;

extracting liquids from said slurry in said top zone;

passing the solid mixture remaining after extraction of said slurry to said middle zone, gasifying the carbon in said solid mixture to carbon monoxide, simultaneously reducing said iron ore, and effecting slag removal by fluidization; and

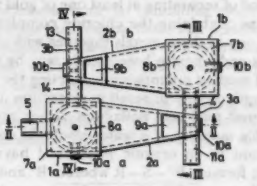
removing said iron to said bottom zone with any residual carbon, introducing carbon dioxide and carbon monoxide to react with residual carbon and substantially completely reducing the iron ore.

3,985,549
PROCESS FOR CONTINUOUSLY REFINING MOLTEN METALS

Paul Rheinländer; Gustav Mahn, both of Wolfenbuttel; Klaus Berner, Salzgitter-Lebensstedt, all of Germany; Klaus Schulz, deceased, late of Wolfenbuttel, Germany, by Ingrid Ruhland, legal representative, Braunschweig, Germany, assignors to Stahlwerke Peine-Salzgitter Aktiengesellschaft, Peine, Germany

Continuation-in-part of Ser. No. 335,812, Feb. 26, 1973, which is a continuation of Ser. Nos. 46,687, June 16, 1970, abandoned, and Ser. No. 825,643, May 19, 1969. This application May 7, 1975, Ser. No. 575,174
Claims priority, application Germany, May 18, 1968, 1758364; June 22, 1968, 1758357; June 18, 1969, 1930746
Int. Cl.² C21C *7/00*
U.S. Cl. 75—52 **19 Claims**

1. In a process of continuously refining molten metal in a refining apparatus having communicating first and second refining stage spaces, wherein refining gas is blown into the molten metal in the presence of a slag layer on the molten metal, the improvement which comprises conveying the molten metal and the slag as two separate non-intermingled streams through said refining stage spaces, as distinguished from a slag-metal emulsion, causing slag in said second refining stage space continuously to flow back into said first refining stage space to form a slag layer on the molten metal in said first refining stage space, blowing refining gas into said molten metal in said first refining stage space below said slag layer, conveying the molten metal from said first refining stage space



to said second refining stage space while preventing the flow of slag from said refining stage space to said second refining stage space, blowing refining gas onto said molten metal in said second refining stage space in the presence of slag and separating the molten metal and the slag from each other after the molten metal has passed through said second refining stage space.

3,985,550
METHOD OF PRODUCING LOW SULFUR STEEL

Ethem T. Turkdogan, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 23, 1975, Ser. No. 543,293
Int. Cl.² C21C *5/34*
U.S. Cl. 75—60 **33 Claims**

1. In the process for refining a molten iron base metal containing sulfur, silicon and carbon as impurities to be removed by refinement wherein at least one oxygen stream, surrounded by a protective jacket fluid, are blown into the bath to oxidize impurities therefrom, the improvement comprising including in said process a distinct and separate desulfurizing blow wherein an inert carrier gas is blown into the bath having a particulate desulfurizing agent suspended therein while maintaining reducing conditions within said bath.

3,985,551
PROCESS FOR REMOVING CARBON FROM URANIUM

George L. Powell, Oak Ridge, and Cressie E. Holcombe, Jr., Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 24, 1976, Ser. No. 660,907
Int. Cl.² C22B *60/02*
U.S. Cl. 75—84.1 R **7 Claims**

1. A method for decreasing the level of carbon contamination in uranium comprising:

a. confining said uranium in inert atmosphere in effective contact with yttrium

b. heating the confined metals to 700°–1900° C for causing carbon from said uranium to react with said yttrium forming yttrium carbide, and

c. recovering uranium reduced in carbon contamination level.

2. The method of claim 1 wherein said effective contact is provided indirectly by directly contacting said uranium with liquid metal diffusion medium, said diffusion medium being in direct contact with said yttrium.

3,985,552

SEPARATION OF PLATINUM GROUP METALS AND GOLD

Roderick Ivan Edwards, Honeydew, South Africa, assignor to National Institute for Metallurgy, Johannesburg, South Africa

Filed Aug. 1, 1975, Ser. No. 600,940

Claims priority, application South Africa, Aug. 9, 1974, 74/5109

Int. Cl.² C22B *11/04*

U.S. Cl. 75—101 BE **21 Claims**

1. A method of separating at least one of gold and palladium from solutions containing the chloride complexes of at least the relevant one of these metals together with other platinum group metals and wherein base metals may be present in the solution said method comprising contacting the solution for a sufficient length of time to result in extraction of substantially all the required gold and palladium values present therein, with a suitable quantity of a water-insoluble non-volatile solvent extractant in an organic phase and having functional groups of the formula $R^1—S—R$ wherein R^1 and R may be the same or different and have a carbon atom thereof joined directly to the sulphur atom; R^1 and R being chosen so that neither of them have active functional groups capable of acting as ion exchangers or complexing groups and thereafter separating the two phases and recovering the extracted gold and palladium.

3,985,553

PROCESS FOR THE RECOVERY OF COPPER AND AMMONIUM SULPHATE FROM COPPER-BEARING MINERAL SULPHIDE ORES OR CONCENTRATES

Wasyl Kunda, Fort Saskatchewan; Boris Rudyk, and Michael Kohut, both of Edmonton, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Apr. 29, 1975, Ser. No. 572,817

Claims priority, application Canada, Oct. 17, 1974, 211606

Int. Cl.² C22B *15/10*

U.S. Cl. 75—103 **13 Claims**

1. A process for treating chalcopyrite ore or concentrate to extract copper values therefrom comprising: subjecting finely divided particles of said chalcopyrite to a first stage leach in which said chalcopyrite particles are leached in an aqueous ammoniacal ammonium carbonate solution in the presence of free oxygen to provide a first stage leach slurry which contains dissolved copper values; separating residue from the first stage leach slurry; subjecting said separated residue to controlled attrition in order to rub off only an outer layer therefrom and to expose surfaces beneath said layer; passing said residue from the preceding step to a second stage leach and leaching same in an aqueous ammoniacal ammonium carbonate solution in the presence of free oxygen to provide a second stage leach slurry; separating solution from said second stage leach slurry and recycling same to said first leach stage; and removing solution from said first stage leach slurry for subsequent treatment for recovery of copper values therefrom.

3,985,554

METHOD FOR REMOVING METALS FROM DILUTE AQUEOUS SOLUTIONS

Frederic C. McCoy, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 418,146, Nov. 21, 1973, abandoned. This application Mar. 27, 1975, Ser. No. 562,997

Int. Cl.² C22B *11/04*, *13/04*, *15/12*, *25/04*

U.S. Cl. 75—109 **4 Claims**

1. A method for removing from dilute aqueous solution metals contained therein in the form of uncomplexed ions, said metals being below iron in the electromotive series and including tin, lead, copper, mercury, silver, rhodium, palladium, platinum and gold, which method comprises passing said solution over an absorbent bed consisting of a major amount of iron particles having a particle size less than 150 microns and 5 to 10 percent by weight of a finely divided calcium - aluminum silicate, maintaining contact between said bed and said solution until the desired reduction in concentration of the metal or metals is obtained and then removing said metal or metals from said bed.

3,985,555

DECOMPOSITION OF CHALCOPYRITE

Monte B. Shirts, Centerville, and Walter L. Staker, Salt Lake City, both of Utah, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 342,920, March 19, 1973, abandoned. This application Jan. 23, 1975, Ser. No. 543,208

Int. Cl.² C22B *15/08*, *15/12*

U.S. Cl. 75—117 **3 Claims**

1. A process for decomposition of chalcopyrite comprising reacting the chalcopyrite with an aqueous hydrochloric acid solution and a metallic reductant consisting of iron or lead to form insoluble metallic copper, solubilize the iron in the chalcopyrite, and convert a major proportion of the sulfur in the chalcopyrite to gaseous hydrogen sulfide, the mole ratio of acid to chalcopyrite being in the range of about 3:1 to 9:1 and the mole ratio of reductant to chalcopyrite being in the range of about 1:1 to 4:1.

3,985,556

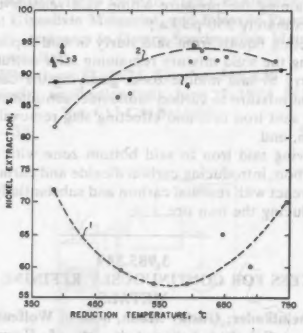
REDUCTION OF LATERITE ORES

Richard E. Siemens, and Philip C. Good, both of Albany, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 22, 1976, Ser. No. 669,360

Int. Cl.² C22B *23/04*

U.S. Cl. 75—119 **6 Claims**



1. A process for the selective reduction of nickel and magnesia-containing laterite ores which comprises:

contacting said ore with a reducing gas consisting essentially of carbon monoxide at a temperature in the range of 300° to 450° C for a time sufficient to reduce substantially all of the nickel contained in the ore to the elemental state, said contacting being performed in the absence of water vapor;

removing said ore from contact with the reducing gas before substantial reduction of iron oxides to metallic iron occurs;

heating the reduced ore in an inert atmosphere at a temperature above about 650° C for a time sufficient to stabilize the elemental nickel in an extractable form, and

cooling the reduced ore to a temperature below about 200° C in an inert atmosphere prior to performing any subsequent processing steps.

3,985,557

METHOD OF PRODUCING A HIGH STRENGTH COMPOSITE OF ZIRCON

Robert N. Sanders, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 349,228, April 9, 1973, abandoned, which is a division of Ser. No. 210,127, Dec. 20, 1971, abandoned. This application Nov. 21, 1974, Ser. No. 525,961

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C22C *1/10, 21/00*

U.S. Cl. 75—135 6 Claims

1. A method for producing a high-strength aluminum composite product containing aluminum as the principal metal and a dispersion therein of a non-metal particulated filler substantially insoluble in the aluminum, which method comprises the following steps: bringing together with stirring a) a quantity of molten aluminum heated to a temperature of about 800 to about 850°C to achieve good fluidity, b) about 5 to about 80 percent zircon by weight of the composite, the zircon having a particle size of about 60 mesh to about 400 mesh U.S. Sieve Series, and c) about 2 to about 10 percent alkaline earth metal by weight of the metallic phase of the composite, continuing the stirring to cause the alkaline earth metal to reduce only the surfaces of the zircon particles and because of such reduction to cause the zircon particles to become substantially stably dispersed throughout the molten metallic phase, and casting the resulting dispersion in a mold to solidify the molten portion and give the composite the desired configuration.

3,985,558

DENTAL ALLOY AND AMALGAM

Harold H. Simpson, Fraser, Mich., assignor to Sybron Corporation, Rochester, N.Y.

Filed Mar. 28, 1975, Ser. No. 563,248

Int. Cl.² C22C *7/00, 30/00*

U.S. Cl. 75—169 7 Claims

1. A dental alloy which consists essentially of about 24 to 45 weight percent silver, 28 to 42 weight percent copper and 29 to 34 weight percent tin, and where the atomic percentage of the total amount of silver plus copper is about 3 times greater than the atomic percentage of tin.

3,985,559

TONER POWDER FOR ELECTROSTATIC IMAGES

Martinus T. J. Peters, Venlo, Netherlands, assignor to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Oct. 16, 1974, Ser. No. 515,318

Claims priority, application Belgium, Oct. 23, 1973, 136973

Int. Cl.² G03G *9/08*

U.S. Cl. 96—1 SD 7 Claims

1. Toner powder for the development of electrostatic images, comprising colored, thermoplastic resin particles, characterized in that said resin particles contain in dissolved condition therein a normal salt of an organic basic dye and an organic acid having at least 6 carbon atoms and having a dissociation constant lower than 4 as measured in water at 25 C., the dye of said salt being selected from the group consisting of di- and triphenylmethane dyes, azine dyes, acridine dyes, oxazine dyes, thiazine dyes, xanthene dyes and monoazodyes.

3,985,560

MIGRATION IMAGING MEMBER WITH FUSIBLE PARTICLES

Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 851,872, Aug. 21, 1969, Pat. No. 3,648,607. This application July 29, 1971, Ser. No. 167,521

Int. Cl.² G03G *5/06, 5/08*

U.S. Cl. 96—1.5 7 Claims

1. An imaging member comprising a substrate, a layer of softenable material on said substrate, said softenable layer comprising softenable material containing electrically photosensitive migration marking particles and a sufficient amount of fusible particles to insure fusing of a migration image, one of said substrate and said fusible photosensitively inert migration particles being substantially transparent; wherein said electrically photosensitive migration marking particles are a fracturable layer contiguous the surface of said softenable layer opposite said substrate and contacting said softenable layer.

3,985,561

DIFFUSION TRANSFER PROCESS USING SILVER HALIDE EMULSIONS WITH 90% CHLORIDE AND HIGH BINDER TO SILVER HALIDE RATIOS

Louis Maria De Haes, Edegem; Leon Louis Vermeulen, Broechem; Hugo Karel Gevers, Edegem; Stephan Jeanne Bongaerts, Berchem; Paul Désiré Van Pee, Edegem, all of Belgium, and Werner Krafft, Leverkusen, Germany, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed June 20, 1974, Ser. No. 481,234

Claims priority, application United Kingdom, June 22, 1973, 29792/73

Int. Cl.² G03C *5/54, 1/48, 1/02*

U.S. Cl. 96—29 R 7 Claims

1. A process for producing continuous tone images on an image-receiving material in a diffusion transfer process comprising the steps of:

a. exposing to a continuous tone original a light-sensitive silver halide emulsion layer containing a mixture of silver chloride and silver iodide and/or silver bromide dispersed in a hydrophilic colloid binder wherein the silver chloride is present in an amount of at least 90 mole % based on the total amount of silver halide and the weight ratio of hydrophilic colloid binder to silver halide expressed as silver nitrate is comprised between about 3:1 and about 10:1,

b. wetting the light-sensitive layer while in close contact with an image-receiving layer separate from said emulsion layer by means of an aqueous alkaline composition in the presence of at least one developing agents for the exposed silver halide, at least one silver complexing agents to dissolve the unexposed and undeveloped silver halide, and at least one agents promoting the reduction to metallic silver of said dissolved silver salt complexes to deposit a silver image on the image-receiving material.

3,985,562

DIAZO RECORDING PROCESS AND MATERIAL

Ludovicus Maria Mertens, Borgerhout, and Gerard Albert Delzenne, 's-Gravenwezel, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Division of Ser. No. 437,763, Jan. 30, 1974, abandoned. This application Oct. 28, 1975, Ser. No. 626,347

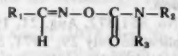
Claims priority, application United Kingdom, May 18, 1973, 23861/73

Int. Cl.² G03C *5/34, 1/60*

U.S. Cl. 96—49 17 Claims

1. A diazo recording process which comprises the steps of (1) information-wise exposing to ultra-violet light and (2) overall heating a recording material comprising a compound yielding an amine on heating, an ultra-violet light-sensitive diazo compound and a coupling component capable of yielding a dyestuff by reaction with unaffected diazo compound

when heating said material and wherein the compound yielding an amine on heating corresponds with the following general formula:



in which:

R_1 represents

1. an aliphatic group or a cycloaliphatic group,
2. an aryl group,
3. a heterocyclic group, or
4. an acyl group,

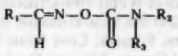
R_2 represents an aliphatic group or a cycloaliphatic group,

R_3 represents

1. hydrogen,
2. an aliphatic group including a cycloaliphatic group, or

R_3 and R_2 form together part of a heterocyclic ring.

8. A recording material containing in or on a support a diazo compound and coupling agent in operative relationship with a thermosensitive amine progenitor corresponding to the following general formula:



wherein:

R_1 represents

1. an aliphatic group or a cycloaliphatic group,
2. an aryl group,
3. a heterocyclic group, or
4. an acyl group,

R_2 represents an aliphatic group or a cycloaliphatic group,

R_3 represents

1. hydrogen,
2. an aliphatic group including a cycloaliphatic group, or

R_3 and R_2 together part of a heterocyclic ring, and

R_4 represents hydrogen.

3,985,563

SILVER HALIDE PHOTOCRAPHIC EMULSION

Masanao Hinata; Haruo Takei; Akira Sato, and Tadashi Ikeda, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

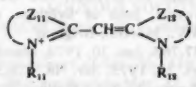
Filed Sept. 9, 1975, Ser. No. 611,753

Claims priority, application Japan, Sept. 9, 1974, 49-103726

Int. Cl.² G03C *1/14*

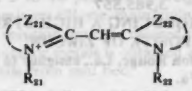
U.S. Cl. 96—69 **17 Claims**

1. A silver halide photographic emulsion containing, in supersensitizing amounts, at least one sensitizing dye represented by the following General Formula (I):



(I)

in which Z_{11} represents an atomic group necessary for completing a pyridine or quinoline nucleus; Z_{12} represents an atomic group necessary for completing an oxazole, benzoxazole, naphthoxazole, imidazole, benzimidazole or naphthimidazole nucleus; and R_{11} and R_{12} each represents an aliphatic group and at least one of R_{11} and R_{12} is an aliphatic group containing a carboxy group or a sulfo group; and at least one sensitizing dye represented by the following General Formula (II):



(II)

in which Z_{21} represents an atomic group necessary for completing a thiazole, benzothiazole, naphthothiazole, selenazole, benzoselenazole or naphthoselenazole nucleus; Z_{22} represents an atomic group necessary for completing an imidazole, benzimidazole or naphthimidazole nucleus; and R_{21} and R_{22} each represents an aliphatic group, and at least one of R_{21} and R_{22} is an aliphatic group containing a carboxy group or a sulfo group.

17. A color photographic light-sensitive material comprising at least two differently sensitized silver halide emulsion layers, at least one of which contains a coupler and at least one of which consists of the photographic emulsion of claim **1.**

3,985,564

PHOTOGRAPHIC ELEMENT AND PROCESS FOR DEVELOPING

James R. King, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 30, 1973, Ser. No. 327,885

Int. Cl.² E03C *1/06*

U.S. Cl. 96—95 **24 Claims**

1. A radiation-sensitive element in which silver halide is the sole source of image-forming silver comprising a water-impermeable support having thereon a radiation-sensitive silver halide layer containing a silver halide developing agent in a binder which is a water-impermeable cellulose ester of a lower aliphatic carboxylic acid having two to four carbon atoms, said binder being permeable to ammonia or amine.

3,985,565

PHOTOTHERMOGRAPHIC, COMPOSITION USING A PHENOLIC LEUCO DYE AS A REDUCING AGENT

Rolf S. Gabrielsen, Rochester, N.Y., and Felice M. Cerquone, Aurora, Colo., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 12, 1974, Ser. No. 488,094

Int. Cl.² G03C *1/02, 1/40, 5/04*

U.S. Cl. 96—114.1 **12 Claims**

1. A photothermographic element for producing developed, color images consisting essentially of a support having coated thereon

a. photographic silver halide in association with

b. a silver salt of a long-chain fatty acid containing 10 to 30 carbon atoms,

c. a phenolic leuco dye reducing agent for said silver salt of a long-chain fatty acid, and

d. a synthetic polymeric binder, said leuco dye reducing agent being oxidizable imagewise.

3,985,566

PHOTOSENSITIVE CROSSLINKABLE 1-CARBONYLOXY-1H-NAPHTHALENE-2-ONE POLYMERS AND PROCESS FOR THEIR PREPARATION

Gerhard Buhr, Schneidhain, Taunus, and Hartmut Steppan, Wiesbaden, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

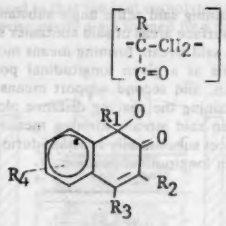
Filed Feb. 12, 1975, Ser. No. 549,429

Claims priority, application Germany, Feb. 14, 1974, 2407033

Int. Cl.² G03C *1/68, 1/70, 5/08*; C08F *8/00*

U.S. Cl. 96—115 R **10 Claims**

1. A polymer capable of being cross-linked by light, which comprises units of the formula



wherein R is hydrogen or methyl; R_1 is a straight-chain or branched, saturated or unsaturated hydrocarbon radical having from 1 to 3 carbon atoms in which a hydrogen atom may be substituted by cyano, (C_1 to C_2) alkoxy, carbo- (C_1 to C_2)-alkoxy, (C_1 to C_2) acyloxy; R_2 and $R_3$are selected from hydrogen, (C_1 to C_4) alkyl, and chlorine; and R_4 is selected from hydrogen, (C_1 to C_4) alkyl, nitro, chlorine and bromine.

3,985,567

METHOD OF TREATING BAUXITE WASTE RED MUD WITH ACID AND MAKING CONSTRUCTION BRICKS FROM THE TREATED MATERIAL

Gregory Onyemauwa Iwu, Georgetown, Guyana, assignor to University of Guyana, Georgetown, Guyana, a part interest

Filed Sept. 18, 1974, Ser. No. 507,089

Int. Cl.² C04B *35/00*

U.S. Cl. 106—73.6 **3 Claims**

1. An improved method of treating bauxite waste red mud comprising Fe_2O_3, SiO_2, Al_2O_3, TiO_2 and Na_2O with acid to remove sodium therefrom and to obtain commercially useful material therefrom, wherein, the improvement comprises:

a. suspending said waste red mud which has been dried in water;

b. titrating the suspension with a molar solution of hydrochloric acid corresponding to the sodium content of the red mud until the pH of the suspension is between 5.5–6;

c. continuously agitating the suspension during titration;

d. allowing the suspension to settle after titration;

e. separating the liquid portion containing sodium chloride from the solid portion;

f. washing said solid portion until portions of the filtrate from said washings yield substantially no crystals on evaporation to dryness;

g. and converting said solid portion to a dry powder.

3,985,568

PIGMENT SUSPENDING AGENTS IN PAINT SYSTEMS

Carl Richard Swenson, Berkeley Heights; Frank C. Naughton, Mountainside, and Armando Franco, Monmouth Junction, all of N.J., assignors to NL Industries, Inc., New York, N.Y.

Filed May 15, 1975, Ser. No. 577,780

Int. Cl.² C08L *1/08, 91/00*

U.S. Cl. 106—171 **4 Claims**

1. A creamy paste comprising finely divided particles of an emulsifiable polyethylene wax suspended in a sulfated-sulfonated castor oil solution, said paste containing from 1 to 6 parts of said wax for each part by weight of said castor oil, said paste useful as a suspending agent for particles in a non-aqueous fluid system.

3,985,569

STABLE PIGMENTS

Louis Antoine Cabut, Nogent sur Oise, and Michel Ernest Antoine Huille, Creil, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed July 15, 1975, Ser. No. 596,133

Claims priority, application France, July 19, 1974, 74.25133

Int. Cl.² C04B *31/00*

U.S. Cl. 106—288 Q **6 Claims**

1. A pigment composition consisting of an admixture of a copper phthalocyanine pigment with 1 to 20% of a stabilizing compound of the formula:

$$Pc + CH_2 - S - A]_n$$

wherein Pc represents the unmetallized or metallized phthalocyanine moiety, A represents alkyl, cycloalkyl, aralkyl unsubstituted or aralkyl substituted by alkyl from 1 to 4 carbon atoms, and *n* is a number from 1 to 8.

3,985,570

STABLE PHTHALOCYANINE PIGMENTS

Louis Antoine Cabut, Nogent sur Oise; Jean-Claude Henri Raoul Hardouin, Chantilly; Michel Ernest Antoine Huille, Creil, and Daniel Francois Xavier Pigasse, Chantilly, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

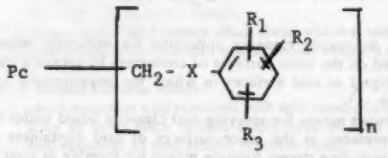
Filed July 15, 1975, Ser. No. 596,136

Claims priority, application France, July 19, 1974, 74.25132

Int. Cl.² C04B *31/00*

U.S. Cl. 106—288 Q **6 Claims**

1. A pigment composition consisting of an admixture of a copper phthalocyanine pigment with 1 to 20% of a stabilizing compound of the formula:



wherein

Pc represents unmetallized or metallized phthalocyanine

X represents oxygen, sulfur or the —NH— bridge,

R_1 represents halogen, alkoxy, trifluoromethyl, trifluoromethoxy, cyano, carboxy, nitro, N-alkylamino or N,N-dialkylamino,

R_2 represents hydrogen, alkyl or alkoxy,

R_3 represents hydrogen or alkyl,

n is a number from 1 to 8,

R_1, R_2 and R_3 being in the ortho, meta or para positions of the benzene ring.

3,985,571

PROCESS FOR THE PRODUCTION OF BERLIN BLUE

Helmut Reinhardt, Rodenkirchen; Karl Trebinger, and Gottfried Kallrath, both of Wesseling, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Division of Ser. No. 438,710, Feb. 1, 1974, Pat. No. 3,915,733. This application June 26, 1975, Ser. No. 590,469

Claims priority, application Germany, Feb. 19, 1973, 2308122; Dec. 10, 1973, 2361354; Dec. 18, 1973, 2362849; Dec. 18, 1973, 2362850

Int. Cl.² C09C *1/26*

U.S. Cl. 106—304 12 Claims

1. A process comprising reacting in water (a) a member of the group consisting of calcium ferrocyanide, sodium ferrocyanide and magnesium ferrocyanide with (b) a water soluble iron II salt which does not form a water insoluble salt with calcium, magnesium or sodium and (c) with a water soluble potassium salt at a pH below 7 to form Berlin white, said process being carried out in one step in which the reaction of (a), (b) and (c) is carried out simultaneously at a temperature commencing between 20 and 60°C.

3,985,572

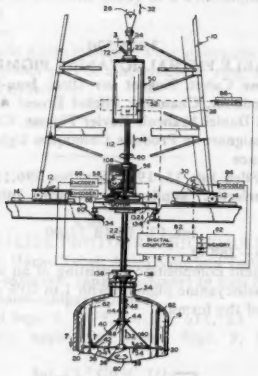
AUTOMATIC SPRAY CLEANING APPARATUS AND METHOD

James P. Petermann, Tigard; Frederick D. Helversen, Portland, and Jack A. Thomas, Tigard, all of Oreg., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Nov. 4, 1974, Ser. No. 520,771

Int. Cl.² B08B *3/02*

U.S. Cl. 134—34 34 Claims



1. Automatic cleaning apparatus for removing material coated on the inner surfaces of containers by spraying cleaning liquid at said surfaces in which the improvement comprises:

sprayer means for spraying said cleaning liquid under high pressure at the inner surfaces of said containers and including stream forming means for forming at least one stream of said liquid having a longitudinal axis;

automatic drive means for moving said stream forming means over the container surfaces along a predetermined path to scan said container surfaces with said liquid stream, said drive means moving said stream forming means about a cleaning axis and longitudinally along said cleaning axis during the scanning; and

support means coupled to said drive means for supporting said sprayer means during said scanning, including first support means for causing the liquid stream to strike container surfaces at an acute angle between said stream axis and the surface impinged thereby and for automatically maintaining said acute angle substantially constant over given surface areas of said container surfaces during scanning as said stream forming means moves about said cleaning axis at a given longitudinal position on said cleaning axis, and second support means for automatically maintaining the spacing distance along the stream axis between said stream forming means and the container surfaces substantially constant during said scanning at said given longitudinal position.

3,985,573

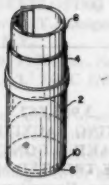
SLOTTED CATHODE COLLECTOR BOBBIN FOR USE IN LIQUID CATHODE CELL SYSTEMS

Daniel H. Johnson, Parma Heights; David M. Kubala, Cleveland, and Roswell J. Bennett, Lakewood, all of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 592,091

Int. Cl.² H01M *43/00*

U.S. Cl. 429—133 18 Claims



1. An electrochemical cell comprising an electrically conductive can closed at one end and open at the other end; an anode layer disposed within and in surface contact with said can thereby adapting said can as a first terminal for the cell; a porous separator layer disposed within and in surface contact with said anode layer; an elastically deformable carbonaceous cathode collector in the form of a slotted annular bobbin disposed within and in surface contact with said separator layer, said cathode collector exerting a bias against said separator which in turn contacts the anode thereby effectively maintaining good physical contact between the cathode collector, separator and anode during discharge of the cell; and active reducible cathode solution disposed within and through said cathode collector and said separator layer; a cover for said can; an insulating member interposed between said cover and the open end of said can such that a seal is formed between said cover and said can; and an electrically conductive means contacting said cathode collector and said cover thereby adapting said cover as the second terminal of the cell.

3,985,574

ELECTROCHEMICAL ELEMENTS IN THIN LAYERS

Georges Feuillade, Arpajon; Bernard Chenaux, Paris, and Philippe Perche, Bures-sur-Yvette, all of France, assignors to Compagnie Generale d'Electricite, Paris Cedex, France

Division of Ser. No. 466,339, May 2, 1974. This application July 24, 1975, Ser. No. 598,917

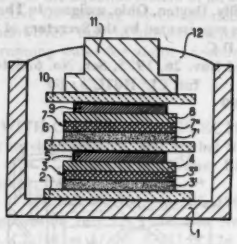
Claims priority, application France, May 18, 1973, 73.18171; Sept. 21, 1973, 73.33972

Int. Cl.² H01M *35/00*

U.S. Cl. 429—162 22 Claims

1. Electrochemical element of the type comprising successively, a first thin layer constituting an electronically conductive cathode collector, a second thin layer forming a catholyte comprising a substance suitable for providing anions capable of forming, with the substance of an anode, a discharge product, a third thin layer forming a separator impermeable to the said catholyte and a fourth thin anode layer comprising lith-

ium, characterized in that the said catholyte as well as the said separator comprise partly a gel formed by a polyvinylic acetal



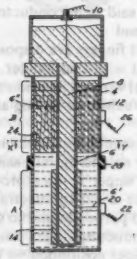
impregnated with at least a solvent and an ionically conductive salt.

3,985,575

SECONDARY BATTERY OR CELL WITH DUAL ELECTRODE

Frank A. Ludwig, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 30, 1976, Ser. No. 653,857
Int. Cl.² H01M 43/00
U.S. Cl. 429—103 24 Claims



1. In a secondary battery or cell comprising:

A. one or more anodic reaction zones containing a molten alkali metal reactant-anode in electrical contact with an external circuit;

B. one or more cathodic reaction zones containing a cathodic reactant which, when said battery or cell is at least partially discharged, is selected from the group consisting of (i) a single phase composition comprising molten polysulfide salts of said anodic reactant and (ii) a two phase composition comprising molten sulfur and molten sulfur saturated polysulfide salts of said anodic reactant;

C. a cation-permeable barrier to mass liquid transfer interposed between and in contact with said anodic and cathodic reaction zones; and

D. electrode means within said cathodic reaction zone for transporting electrons to the vicinity of said cation-permeable barrier during discharge of said battery or cell and for transporting electrons away from the vicinity of said cation-permeable barrier during charge of said battery or cell, said electrode means being in electrical contact with both said cation-permeable barrier and said external circuit and being immersed, at least in part, in said cathodic reactant, wherein the improvement comprises:

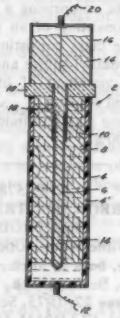
an electrode means which comprises first and second electrodes, said first electrode being (i) adapted to be in use during charge of said battery or cell, (ii) disposed in a first region of said cathodic reaction zone, and (iii) contiguous with or adjacent to first section of said cation permeable barrier, and formed of a conductive material which exhibits a contact angle with said molten polysulfide which is less than the contact angle it exhibits with molten sulfur during operation of said battery or cell, and said second electrode being (i) adapted to be in use during discharge of said battery or cell, (ii) disposed in a second region of said cathodic reaction zone, and (iii) contiguous with or adjacent to a second section of said cation-permeable barrier, and formed of a conductive material which exhibits a contact angle with said molten sulfur which is less than the contact angle it exhibits with said molten polysulfide during operation of said cell.

3,985,576

SEAL FOR ENERGY CONVERSION DEVICES

James N. Lingscheit, Dearborn, and Thomas J. Whalen, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 18, 1976, Ser. No. 658,981
Int. Cl.² H01M 43/00
U.S. Cl. 429—103 19 Claims



1. In an energy conversion device comprising:

A. An anodic reaction zone

i. which contains a molten alkali metal anode-reactant in electrical contact with an external circuit, and

ii. which is disposed interiorly of a tubular cation-permeable barrier to mass liquid transfer;

B. A cathodic reaction zone

i. which is disposed exteriorly of said tubular cation-permeable barrier, and

ii. which contains an electrode which is in electrical contact with both said tubular cation-permeable barrier and said external circuit;

C. A reservoir for said molten alkali metal which is adapted to supply said anodereactant to said anodic reaction zone; and

D. A tubular ceramic header

i. which connects said reservoir with said anodic reaction zone so as to allow molten alkali metal to flow from said reservoir to said anodic reaction zone;

ii. which is sealed to said tubular cation-permeable barrier, and

iii. which is impervious and nonconductive so as to preclude both ionic and electronic current leakage between said alkali metal reservoir and said cathodic reaction zone,

wherein the improvement comprises a lap joint seal between said tubular ceramic header and said tubular cation-permeable barrier which is formed by

1. disposing the end portion of a first one of said tubes, which has been sintered to final density, inside the end portion of the second of said tubes which (i) is not sin-

tered to final density, (ii) has an inner diameter in the unsintered state greater than the outer diameter of said first tube, and (iii) upon being sintered to final density is adapted to shrink to the extent that the inner diameter thereof is at least 0.002 inches less than the said outer diameter of said first tube; and

2. sintering said second tube to final density to shrink the same and effect a seal between said first and second tubes.

3,985,57[illegible]

LITHIUM/FLUOROGRAPHITE PRIMARY CELL WITH IMPROVED ELECTROLYTE

Jerry L. Russell, Joplin, Mo., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Continuation of Ser. No. 285,529, Aug. 31, 1972, abandoned. This application Sept. 12, 1974, Ser. No. 505,474

Int. Cl.[2] H01M *17/02*

U.S. Cl. 429—194 **8 Claims**

1. A primary cell comprising,

a lithium anode,

a cathode having as the active component thereof a fluorographite of the type $(CF_x)_n$ where x is greater than about 0.5 and n is an indefinitely large number,

and an electrolyte comprising a solvent and a solute, the said solvent consisting of an organic liquid which is a member of the class consisting of dimethyl sulfite and mixtures of dimethyl sulfite and methyl formate,

the said solute consisting of lithium hexafluoroarsenate dissolved in said solvent,

the said cell having a yield efficiency which is substantially in excess of 100%.

3,985,578

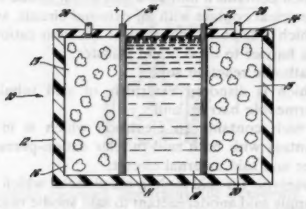
TAILORED-CARBON SUBSTRATE FOR FUEL CELL ELECTRODES

Romeo Richard Witherspoon, Utica, and Richard Leighton Adams, Ferndale, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed June 27, 1975, Ser. No. 591,075

Int. Cl.[2] H01M *4/86, 4/88*

U.S. Cl. 429—44 **4 Claims**



1. A method of preparing a carbonaceous material suitable for use in the electrocatalytic substrate of fuel cell electrodes comprising the steps of:

a. depositing from solution onto carbon particles having an average particle diameter in the range of from about 0.07 microns to about 130 A and pores with a diameter in the range of from 30 A to 300 A a copolymer consisting essentially of at least 85 percent by weight of vinylidene chloride and the balance being a compatible vinyl monomer or mixtures thereof, the amount of said copolymer deposited being such that its carbon content contributes from about 1 to about 15 percent by weight of the total carbon content of the carbon particle-copolymer mixture;

b. then heating the mixture to a temperature in the range of from 700° C. to 1,400° C. to pyrolyze the polymer and generate a porous carbon char therefrom.

3,985,579

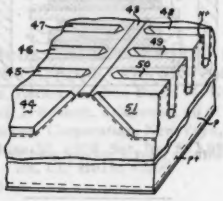
RIB AND CHANNEL VERTICAL MULTIJUNCTION SOLAR CELL

William P. Rahilly, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 26, 1975, Ser. No. 635,464

Int. Cl.[2] H01L *31/04*

U.S. Cl. 136—89 **2 Claims**



1. A vertical multijunction solar cell having a plurality of channels providing vertical junctions formed in the upper surface of a semiconductor substrate, a conducting surface on the bottom of said substrate providing an electrical contact and a header on the upper surface of said substrate for providing electrical contact with the cell, the improvement wherein:

a. said channels in said substrate are parallel to said header and are formed in strips perpendicular to said header with ribs formed of said semiconductor substrate between adjacent strips; and

b. electrical contact fingers are disposed on said ribs and in electrical contact with said header.

2. A rib and channel vertical junction solar cell comprising:

a. a semiconductor substrate having an upper surface and a lower surface;

b. a plurality of adjacent parallel channels of vertical photovoltaic junctions extending into said semiconductor substrate from said upper surface providing strips of channels, each having a rib of substrate material, said ribs being at each end perpendicular to each of said channels;

c. an electrical conducting finger positioned on each rib;

d. an electrical header positioned on the said upper surface of the substrate in electrical contact with each finger and providing a first electrical contact to the said cell; and

e. an electrical conductor positioned on the said lower surface providing a second electrical contact to the said cell.

3,985,580

WETTABLE POLYOLEFIN BATTERY SEPARATOR

Joseph Cogliano, Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,464

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.[2] H01M *2/14*

U.S. Cl. 264—121 **4 Claims**

1. In a process for preparing a porous compacted, selfsupporting, nonwoven mat of polyolefin fiber useful as a battery separator comprising extruding a heated polyolefin through multiple die openings into a gas stream to attenuate the polyolefin into fibers having a diameter of about 1–10 microns, collecting the fibers as a selfsupporting nonwoven mat having a thickness of 20–100 mils, contacting the selfsupporting nonwoven mat with an aqueous system comprising water and an amount of a surfactant effective for making the selfsupporting nonwoven mat wettable, drying the resulting wettable, selfsupporting, nonwoven mat, and compacting the dried, wettable, selfsupporting, nonwoven mat to form the porous compacted, wettable, selfsupporting, nonwoven mat of polyolefin fiber useful as a battery separator, said compacted mat

having a thickness of about 10–40 mils and pores having a pore size of about 10–40 microns, the improvement comprising the presence in the aqueous system of an amount of colloidal silica effective for causing the compacted, wettable, self-supporting, nonwoven mat to remain wettable after being washed with running water for about 16 hours.

3,985,581

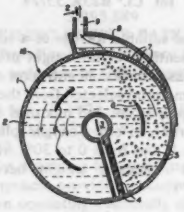
CELL WITH CIRCULATING ELECTROLYTE

Zbigniew Stachurski, Brooklyn, and Michel N. Yardney, New York, both of N.Y., assignors to Yardney Electric Corporation, Pawcatuck, Conn.

Continuation of Ser. No. 597,954, Nov. 30, 1966, abandoned. This application July 31, 1970, Ser. No. 64,133

Int. Cl. H01m *11/00, 31/02;* **C22d** *1/02*

U.S. Cl. 429—51 **7 Claims**



1. In a rechargeable electrochemical cell having a housing, a reversible metallic first electrode in said housing, and a gas-diffusion-type second electrode defining with said first electrode a first fluid space in said housing containing a liquid electrolyte, the combination therewith of:

a supply of depolarizing gas under pressure;

conduit means leading from said supply to said housing and terminating in an apertured element opening into said first fluid space, said conduit means including a branch opening into a second-fluid space adjacent a dry face of said second electrode and separated from said first fluid space by said second electrode;

and valve means for directing gas from said supply into said first fluid space through said apertured element during a charging phase for physically agitating said electrolyte, and into said second fluid space through said branch during a discharging phase for interaction with said second electrode to generate a current flow between said electrodes and a load.

3,985,582

PROCESS FOR THE IMPROVEMENT OF REFRACTORY COMPOSITE MATERIALS COMPRISING A MATRIX CONSISTING OF A SUPERALLOY AND REINFORCING FIBERS CONSISTING OF A METAL CARBIDE

Herve Bibring, Meudon; Jean-Pierre Trottier, Bagneux; Tasadduq Khan, Plessis-Robinson; Jean-Francois Stohr, Bourg-la-Reine, and Maurice Rabinovitch, Chatillon, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon, France

Filed July 18, 1974, Ser. No. 489,482

Claims priority, application France, July 30, 1973, 73.27854

Int. Cl.[2] B22D *25/00;* **C22C** *19/05*

U.S. Cl. 148—3 **7 Claims**

1. A process for making an improved refractory metallic composite material which comprises the steps of:

a. directionally solidifying a metal-alloy melt having the following composition:

chromium	between 10% and 20%
nickel	between 0% and 30%
tantalum	between 0% and 14%
niobium	between 0% and 9%
carbon	between 0.7% and 1%
cobalt	sufficient for 100%
chromium	between 10% and 20%
cobalt	between 0% and 30%
aluminum	between 0% and 6%
tantalum	between 0% and 18%
niobium	between 0% and 9%
carbon	between 0.4% and 0.9%
nickel	sufficient for 100%

and further including:

a. an effective amount of at least one hardening element selected from the group which consists of tungsten, molybdenum and rhenium, said tungsten being present in an amount up to 10% by weight of the composite, said molybdenum being present in an amount up to 5% by weight of the composite and said rhenium being present in an amount up to 5% by weight of the composite to form (1) a superalloy complex matrix phase consisting predominantly of cobalt, nickel or combinations thereof and chromium, and (2) a monocrystalline reinforcing fiber phase consisting of monocarbides of the transition metals of groups IV and V;

b. reheating the material directionally solidified in step (a) to a temperature approximately 50° C below the melting point of the material for a period sufficient to attain the new equilibrium conditions corresponding to a superficial solubilization of said fiber phase in said matrix phase; and

c. aging the directionally solidified material subsequent to said solubilization at a temperature of 700° C to 1100° C for a period of four to twenty four hours to precipitate the previously solubilized carbide in finely divided polyhedral form through the matrix phase and in an amount effective to increase the hardness of the composite.

3,985,583

METHOD FOR FORMING AN INSULATING COATING ON AN ORIENTED SILICON STEEL SHEET

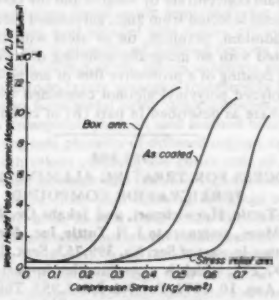
Hiroshi Shimanaka, Funabashi; Toshio Ichida, and Shigeru Kobayashi, both of Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Sept. 19, 1974, Ser. No. 507,283

Claims priority, application Japan, Nov. 17, 1973, 48-129495

Int. Cl.[2] C23F *7/10, 7/26*

U.S. Cl. 148—6.16 **4 Claims**



1. A method for forming an insulating coating on an oriented steel sheet having a forsterite coating on its surface, said method comprising; applying a coating of an aqueous dispersion of 7–24% by weight of colloidal silica, 5–30% by weight

of magnesium phosphate as monobasic magnesium phosphate, and 0.01–5% by weight of at least one member of the group consisting of chromic anhydride, chromate and bichromate, wherein the compounding ratio of magnesium phosphate to colloidal silica is 20/80–30/70%.

3,985,584

METAL PROTECTIVE COATING COMPOSITIONS, THEIR PREPARATION AND USE

Francis Chee Keung Chan, Berkeley Heights, and Edward Heinzelman, Jr., Palisades, both of N.J., assignors to Oakite Products, Inc., Berkeley Heights, N.J.

Continuation-in-part of Ser. No. 34,904, May 5, 1970, abandoned. This application Oct. 25, 1972, Ser. No. 300,662

Int. Cl.² C23C *11/00*

U.S. Cl. 148—6.16 **15 Claims**

1. An aqueous acid, metal surface treating composition selected from

A. the concentrate containing by weight a total of from about 60 to about 85% of essential co-acting ingredients dissolved in from about 40 to about 15% of water, which essential co-acting ingredients

a. consist essentially of chromium phosphate, chromic acid, a phosphate-ion-providing compound selected from phosphoric acid and its equivalent of an alkali metal or ammonium dihydrogen phosphate, the at least 99% hydrolyzed polyvinyl alcohol combined with chromium and phosphate, and a phosphate of a water-soluble, non-aromatic primary, secondary or tertiary amine having from one to about 12 carbon atoms and selected from alkyl amines, alkanol amines, morpholine and lower alkyl ring- or N-substituted morpholine, or mixtures of any of these amines, and

b. are the products of admixing together in the water (i) as the most predominant constituent from about 9.6 to about 40 percent of phosphoric acid calculated as anhydrous H_3PO_4 or its phosphate ion equivalent of an alkali metal or ammonium dihydrogen phosphate, (ii) as the next predominant constituent from about 5% to about 30% of chromic acid as CrO_3, (iii) the aforesaid polyvinyl alcohol as the third essential constituent to the extent of from about 0.1 to about 10%, and (iv) as the fourth essential ingredient the aforesaid water-soluble, non-aromatic primary, secondary or tertiary amine and to the extent of from about 0.1 to about 1 percent of the concentrate; and heating their mixture to a temperature sufficient to induce the combining reaction of the chromic acid and phosphoric acid with the polyvinyl alcohol, and maintaining the temperature at from about 170° to about 210° F. until the bubbling caused by the exothermicity subsides; and

B. a treating bath composed of from 0.5 percent of the aforesaid concentrate by volume and the rest being water.

14. A metal selected from zinc, galvanized steel, aluminum, copper, cadmium, titanium, tin or steel with its surface directly coated with an integrally adhering dry water-insoluble deposition coating of a protective film of amine-cured at least 99% hydrolyzed polyvinyl alcohol combined with chromium and phosphate as described in part (b) of claim 1.

3,985,585

PROCESS FOR TREATING ALUMINUM WITH FERRICYANIDE COMPOUND

Bertha S. Tuttle, Harwichport, and Jekabs Ozolins, Holliston, both of Mass., assignors to J. N. Tuttle, Inc., Medford, Mass.

Continuation-in-part of Ser. No. 399,753, Sept. 21, 1973, Pat. No. 3,897,278, which is a continuation-in-part of Ser. No. 170,668, Aug. 10, 1971, Pat. No. 3,765,952. This application July 24, 1975, Ser. No. 598,713

The portion of the term of this patent subsequent to Oct. 16, 1990, has been disclaimed.

Int. Cl.² C23F *5/04*

U.S. Cl. 148—6.27 **20 Claims**

1. A process for forming a corrosion and heat resistant, readily dyeable coating on member selected from the group of aluminum, its alloys, and substrates having an aluminum or aluminum alloy surface, said process comprising the step of formation of said coating using chemical means consisting of contacting the surface of said part with a spray comprising an aqueous alkaline solution of a ferricyanide salt having a pH between about 7.5 and 14.0, said ferricyanide salt being present in an amount of at least 0.01 moles per liter of solution.

3,985,586

PHOSPHORIC ACID SOLDERING FLUX

Edward G. Choby, Jr., Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,744

Int. Cl.² B23K *35/24*

U.S. Cl. 148—23 **12 Claims**

1. A viscous fluid suitable for use as a soldering flux; said fluid consisting essentially of, in weight precent, 35 to 85% phosphoric acid (based on a concentration of 75 to 95%), 15 to 65% of organic material selected from the group consisting of polyethers and polyimines and mixtures thereof having an atomic ratio of carbon to ether oxygen plus imine nitrogen between 1.5 and 3.1, and from 0 to 30% water, said organic material having a molecular weight between 4,000 and 20,000.

3,985,587

PHOSPHORIC ACID SOLDERING FLUX

Edward G. Choby, Jr., Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,765

Int. Cl.² B23K *35/24*

U.S. Cl. 148—23 **18 Claims**

1. A viscous fluid suitable for use as a soldering flux; said fluid consisting essentially of, in weight percent, 25 to 80% phosphoric acid (based on a concentration of 75 to 95%), 15 to 65% of organic material selected from the group consisting of polyethers and polyimines and mixtures thereof having an atomic ratio of carbon to ether oxygen plus imine nitrogen between 1.5 and 3.1, from 0.1 to 15% of copper containing material, from 0 to 40% of ammonium salt, and from 0 to 30% water; said organic material having a molecular weight between 4,000 and 20,000.

3,985,588

SPINNING MOLD METHOD FOR MAKING PERMANENT MAGNETS

Joseph Lyman, Kennebunk, Maine, assignor to Cambridge Thermionic Corporation, Cambridge, Mass.

Filed Feb. 3, 1975, Ser. No. 546,581

Int. Cl.² H01F *1/02*

U.S. Cl. 148—103 **9 Claims**

1. The method of making a permanent magnet which comprises:

a. introducing a quantity of hardenable resinous material into a hollow mold,

b. spinning said mold about an axis thereof to force said material against an internal surface of said mold,

c. introducing premagnetized particles of powdered permanent magnet material into said resinous material while said mold is being spun, the rate of spinning of said mold being sufficient to cause said particles to be uniformly distributed around the circumference of said resinous material and throughout its length and to become densely concentrated in a region of said body of resinous material in the vicinity of its peripheral surface while leaving a lower concentration of said particles in the region of the inner surface of said body,

d. exposing said particles to a magnetic field while they are being introduced into and distributed throughout said resinous material to align said particles magnetically,

e. and hardening said resinous material while said mold is spun to form a body thereof in which said particles are magnetically aligned to form an effective permanent magnet structure.

3,985,589
PROCESSING COPPER BASE ALLOYS

Stanley Shapiro, New Haven, and Richard D. Lanam, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

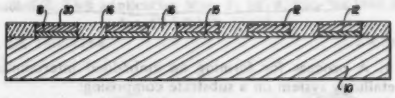
Filed Nov. 1, 1974, Ser. No. 520,053
Int. Cl.² C22F 1/08; C21D 1/00
U.S. Cl. 148—160 **4 Claims**

1. A process for obtaining improved stress corrosion resistance which comprises: providing a copper base alloy in the wrought condition consisting essentially of from 12.5 to 30% nickel, 12.5 to 30% manganese, balance copper; initially aging said material at a temperature of from 400° C for from 30 minutes to 10 hours; following said initial aging step by cooling at a rate less than 100° C per hour to a temperature of from 150° to 375° C; and finally aging said material at a temperature of from 150° to 375° C for from 30 minutes to 10 hours.

3,985,590
PROCESS FOR FORMING HETEROEPITAXIAL STRUCTURE

Donald R. Mason, Indialantic, Fla., assignor to Harris Corporation, Cleveland, Ohio

Division of Ser. No. 369,422, June 13, 1973, Pat. No. 3,935,040, which is a division of Ser. No. 190,778, Oct. 20, 1971, Pat. No. 3,766,447. This application Dec. 15, 1975, Ser. No. 641,059
Int. Cl.² H01L 21/205, 31/12, 21/84
U.S. Cl. 148—175 **14 Claims**



1. A process for preparing a single crystal silicon substrate for the production of light emitting diodes comprising:

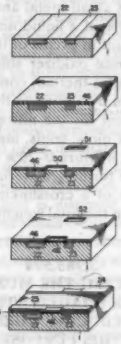
epitaxially depositing a thin layer of single crystal silicon-germanium semiconductor material on a major surface of said substrate to form a graded layer having a crystal lattice constant determined by a substantially zero germanium concentration for substantially matching the crystal lattice constant of said substrate at the boundary therebetween and having a crystal lattice constant determined by the maximum germanium concentration for substantially matching the crystal lattice constant of a preselected electroluminescent single crystal semiconductor material at a second surface; and

epitaxially depositing said preselected electroluminescent semiconductor material in single crystal form on said second surface of said graded layer.

3,985,591
METHOD OF MANUFACTURING PARALLEL GATE MATRIX CIRCUITS

Shigeru Arita, Ibaragi, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 340,253, March 13, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,735
Claims priority, application Japan, Mar. 14, 1972, 47-26255
Int. Cl.² H01L 21/22, 27/10
U.S. Cl. 148—187 **1 Claim**



1. A method for fabricating a parallel gate matrix circuit in a self-alignment type metal oxide semiconductor large scale integration circuit, said parallel gate matrix circuit including a silicon substrate, a plurality of diffused regions of opposite conductivity-type to that of the silicon substrate and a plurality of gate electrode layers arranged transversely to said diffused regions to form metal oxide semiconductor field-effect transistors at crosspoints thereof, said method comprising the steps of forming said plurality of diffused regions extending in parallel to each other; covering the entire area of the silicon substrate surface in which said diffused regions are fabricated with a field oxide film; then forming openings at required portions of the area of said field oxide film between said diffused regions simultaneously with the formation of diffusing windows using a diffusion mask for self-alignment; forming a gate oxide film in said openings; and thereafter forming a polycrystalline silicon or molybdenum gate electrode layer in transverse relation with said extended diffused regions, at least a portion of said gate electrode layer lying on said gate oxide film, whereby metal oxide semiconductor field-effect transistors are formed in only those areas where said gate oxide film is formed.

3,985,592

SURFACE-INHIBITED PROPELLENT CHARGE

Clarence Bertram Hackett, Kilmarnock; James Jack, Troon, and Richard Paton Reynolds, Largs, all of Scotland, assignors to Imperial Chemical Industries Limited, London, England

Filed June 11, 1968, Ser. No. 738,720
Claims priority, application United Kingdom, June 13, 1967, 27162/67
Int. Cl.[2] C06B 45/36
U.S. Cl. 149—4 19 Claims

1. A surface-inhibited propellent charge comprising a charge of propellent composition having bonded to at least part of its surface an inhibiting layer comprising silicone rubber supported on biaxially-stretchable glass fabric.

3,985,593

WATER GEL EXPLOSIVES

Oldrich Machacek, Allentown, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Filed July 28, 1975, Ser. No. 599,932
Int. Cl.[2] C06B 31/12, 29/16, 25/36
U.S. Cl. 149—62 34 Claims

1. A method for producing a single phase water gel explosive composition in which a liquid paraffin sensitizer having 1–3 carbon atoms is completely solubilized consisting of the steps of mixing 40–90% of an aqueous perchlorate oxidizer solution having a concentration of 50–80% and selected from the group consisting of alkali metal and alkaline earth metal perchlorates with 5–50% of a liquid nitroparaffin having 1–3 carbon atoms, an amount in excess of that which can be solubilized in the perchlorate oxidizer solution, to substantially solubilize the nitroparaffin therein, completing the solubilization of the nitroparaffin by adding to the mixture 1–30% of a further solubilizing agent for the nitroparaffin selected from the group consisting of diols, triols, methyl, ethyl and propyl alcohols, adding to the mixture 0–20% of a particulate aluminum, 0–5% void space forming material, 0–1.3% of a gelling agent and 0.02–0.03% of a crosslinking agent, said percent values being based upon the total weight of the composition.

3,985,594

METHOD OF REDUCING THE MUZZLE FLASH WHEN FIRING FIREARMS LOADED WITH POWDER, AND POWDER FLASH-REDUCING AGENT INTENDED FOR THIS PURPOSE

Lars-Erik Björn, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed June 16, 1975, Ser. No. 587,524
Claims priority, application Sweden, July 9, 1974, 7408996
Int. Cl.[2] C06B 25/02; C01B 27/00
U.S. Cl. 149—108.4 4 Claims

1. A method of reducing the muzzle flash formed when firing firearms loaded with powder, comprising adding up to 5% by weight of the salt sodium hexahydroxy antimonate to the powder.

3,985,595

INSENSITIVE EXPLOSIVE COMPOSITION OF HALOGENATED COPOLYMER AND TRIAMINOTRINITROBENZENE

Theodore M. Benziger, Santa Fe, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 29, 1974, Ser. No. 528,380
Int. Cl.[2] C06B 45/10, 25/04; C07C 79/10
U.S. Cl. 149—19.3 1 Claim

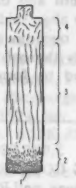
1. A highly insensitive, heat resistant plastic bonded explosive comprising about 90 wt% of triaminotrinitrobenzene and about 10 wt% of a fully saturated copolymer of chlorotrifluoroethylene and vinylidene fluoride.

3,985,596

PROCESS FOR PRODUCING CRYSTAL-ORIENTED PERMANENT MAGNETS

Erich Steingroever, Bonn, Germany, assignor to Magnetfabrik Bonn GmbH vorm. Gewerkschaft Windhorst, Bonn am Rhine, Germany

Filed July 19, 1974, Ser. No. 489,892
Claims priority, application Germany, July 20, 1973, 2336901
Int. Cl.[2] C23F 1/00
U.S. Cl. 156—6 11 Claims



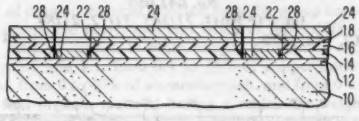
1. In a process for preparing anisotropic permanent magnets, comprising the steps of introducing molten permanent magnet material into a vertically elongated mold, unilaterally abstracting heat to solidify the material in said mold and to cause growth of crystals in an upward direction from the bottom of the mold, removing mold material from the magnet material after solidification of the magnet material into a bar, treating the surface of the solidified bar with an etching solution to expose the crystalline structure of the bar, and subdividing the etched bar.

3,985,597

PROCESS FOR FORMING PASSIVATED METAL INTERCONNECTION SYSTEM WITH A PLANAR SURFACE

Laura B. Zielinski, Plantsville, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1975, Ser. No. 573,678
Int. Cl.[2] H01L 21/312, 21/443
U.S. Cl. 156—11 14 Claims



1. A process for forming an embedded interconnection metallurgy system on a substrate comprising:

forming a first layer of an organic thermosetting polymerized resin material on the top surface of said substrate;

forming a second overlying layer of a second organic polymerized resin material that is soluble in a solvent that does not appreciably affect the material of said first layer;

forming a third thin layer resistant to reactive ion etching in O_2 on said second layer,

depositing a resist layer over said third layer, exposing the resist to form an inverse pattern of the desired metallurgy pattern and developing the resist;

removing the resultant exposed areas of said third layer;

reactive ion etching the resultant exposed areas for a time sufficient to completely remove the exposed portions of said first and second layers;

depositing over said third layer and exposed areas of said substrate a blanket conductive metal layer having a thick-

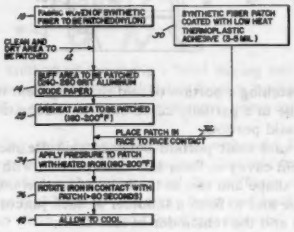
ness approximately matching the thickness of said first layer; and

exposing said substrate to a solvent that is selective to the material of said second layer for a time sufficient to remove said second layer and overlying portions of said conductive metal layer.

3,985,598
MATERIAL REPAIR PROCESS

Dorn D. Trenda, Anoka, and Donald R. Anderson, Blaine, both of Minn., assignors to The Perma Company, Anoka, Minn.

Filed Nov. 18, 1974, Ser. No. 524,409
Int. Cl.² B32B 35/00
U.S. Cl. 156—54 **9 Claims**


SYNTHETIC FIBER PATCH COATED WITH LOW HEAT THERMOPLASTIC ADHESIVE (3-5 MIL.)
CLEAN AND DRY AREA TO BE PATCHED
BUFF AREA TO BE PATCHED (280-350 GRIT ALUMINUM OXIDE PAPER)
PREHEAT AREA TO BE PATCHED (280-300°F)
PLACE PATCH IN FACE TO FACE CONTACT
APPLY PRESSURE TO PATCH WITH HEATED IRON (280-300°F)
ROTATE IRON IN CONTACT WITH PATCH (~60 SECONDS)
ALLOW TO COOL

1. A method of reinforcing an area of nylon fiber fabric using a reinforcing swatch of nylon fabric to one side of which a heat-activatable adhesive having a working temperature below the temperature at which nylon fabric may be damaged has been applied, comprising the steps of:

a. buffing one side of the area to be reinforced to artificially raise a slight nap on the nylon fibers thereof;

b. placing said reinforcing swatch on said fabric with said one side thereof in face-to-face contact with said buffed side of the area to be reinforced;

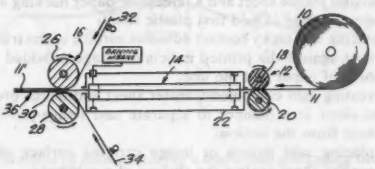
c. heating said swatch and said area to the working temperature of said adhesive; and

d. pressing said swatch and said fabric together with said adhesive at said working temperature.

3,985,599
SLIT FILM

Pierre Lepoutre, 552 St. John, Pointe Claire, Quebec, Canada, and Heinz Alfred Pieniak, 15030 El Vista Ave., Oak Forest, Ill. 60452

Continuation of Ser. No. 186,838, Oct. 6, 1971, Continuation-in-part of Ser. No. 93,646, Nov. 30, 1970, abandoned. This application Mar. 5, 1974, Ser. No. 448,249
Int. Cl.² B32B 31/08
U.S. Cl. 156—164 **2 Claims**



1. In a method for making a cross laminate consisting of at least two uniaxial oriented layers in which the direction of orientation of each layer is disposed at an angle to one another, the improvement which comprises continuously supplying a continuous orientable stretchable thermoplastic first film to a first slitting means, continuously slitting said first film with a plurality of substantially parallel spaced apart slits in a pattern to form a plurality of interconnected substantially parallel first film ribbons with the long axis of said ribbons substantially parallel to the longitudinal direction of said film to produce a first slit film, continuously feeding said first slit film to a longitudinal stretching means, continuously stretching said first slit film and said ribbons in said longitudinal direction to elongate, orient, and neck down said ribbons thereby reducing the width of said ribbons and forming openings therebetween and to produce a first relaxable oriented film, relaxing said first relaxable film to produce a first curled film, heat setting said first curled film to produce a first uniaxially oriented layer having a high inherent stretchability, continuously feeding said first oriented layer under longitudinal tension into a laminator, continuously supplying a continuous orientable stretchable thermoplastic second film to a second slitting means, continuously slitting said second film with a plurality of substantially parallel spaced apart slits in a pattern to form a plurality of interconnected substantially parallel second film ribbons with the long axis of said second film ribbons substantially parallel to the lateral direction of said film to form a second slit film, continuously feeding said second slit film to a lateral stretching means, continuously stretching said second slit film and said second film ribbons in said lateral direction to elongate, orient, and neck down said ribbons thereby reducing the width of said ribbons and forming openings therebetween and to produce a second relaxable oriented film, relaxing said second relaxable film to produce a second curled film, heat setting said second curled film to produce a second uniaxially oriented layer having a high inherent stretchability continuously feeding said second oriented layer under lateral tension into said laminator, each of said first and second films and layers is disposed in substantially horizontal and parallel planes one above the other and each is supplied and stretched simultaneously and is fed simultaneously under tension into said laminator, continuously laminating said first and second layers to produce said cross laminate.

2. In a method for making a cross laminate consisting of at least two uniaxial oriented layers in which the direction of orientation of each layer is disposed at an angle to one another, the improvement which comprises continuously supplying a continuous orientable stretchable thermoplastic first film to a first slitting means, continuously slitting said first film with a plurality of substantially parallel spaced apart slits in a pattern to form a plurality of interconnected substantially parallel first film ribbons with the long axis of said ribbons substantially parallel to the longitudinal direction of said film to produce a first slit film, continuously feeding said first slit film to a first pleating means, pleating said first slit film to produce a first pleated film having pleats running in the longitudinal direction, the extent of the pleating being such so as to determine the width to which said slits shall open during the stretching step by allowing said film as a whole to neck down, continuously feeding said first pleated film to a longitudinal stretching means, continuously stretching said first pleated film and said ribbons in said longitudinal direction to elongate, orient, and neck down said ribbons thereby reducing the width of said ribbons and forming openings therebetween as determined by said pleating and to produce a first uniaxially oriented layer, continuously feeding said first oriented layer under longitudinal tension into a laminator, continuously supplying a continuous orientable stretchable thermoplastic second film to a second slitting means, continuously slitting said second film with a plurality of substantially parallel spaced apart slits in a pattern to form a plurality of interconnected substantially parallel second film ribbons with the long axis of said second film ribbons substantially parallel to the lateral direction of said film ribbons with the long axis of said second film ribbons substantially parallel to the lateral direction of said film to form a second slit film, continuously feeding said second slit film to produce a second pleated film having pleats running in the lateral direction, the extent of the pleating being such so as to determine the width to which said slits shall open during the stretching step by allowing said film

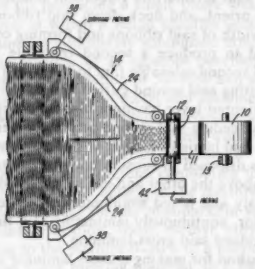
as a whole to neck down, continuously feeding said second pleated film to a lateral stretching means, continuously stretching said second pleated film and said ribbons in said lateral direction to elongate, orient, and neck down said ribbons thereby reducing the width of said ribbons and forming openings therebetween as determined by said pleating and to produce a second uniaxially oriented layer, continuously feeding said second oriented layer under lateral tension into said laminator, each of said first and second films and layers is disposed in substantially horizontal and parallel planes are above the other and each is supplied and stretched simultaneously and is fed simultaneously under tension into said laminator, continuously laminating said first and second layers to produce said cross laminate.

3,985,600

METHOD FOR SLITTING A FILM

Leo Blais, Shawinigan, Canada, assignor to Consolidated-Bathurst Limited, Montreal, Canada

Filed July 9, 1971, Ser. No. 161,045
Int. Cl.² B32B *31/00*
U.S. Cl. 156—229 **9 Claims**



1. A method for the continuous production of an apertured sheet of a thermoplastic polymeric material comprising

a. providing a slitting means comprising a rotatable slitting roll and a backing roll having their longitudinal axes parallel; said rolls being spaced to provide a nip therebetween, said slitting roll having a plurality of spaced apart slitting blades extending from the circumferential surface of said slitting roll, said backing roll having a heat resistant, resilient circumferential surface,

b. heating said slitting blades such that at least the cutting edges have a temperature above the softening temperature range of said thermoplastic polymeric material,

c. feeding an unoriented film of said thermoplastic polymeric material under tension through said nip,

d. pressing the film in said nip against said backing roll with the heated cutting edges of said blades, whereby said blades penetrate and fusion-cut corresponding slits in said film, and

e. stretching said film such that the resulting slits open to form apertures.

3,985,601

METHOD FOR PRODUCING A BALLOON TYPE CATHETER HAVING A SMOOTH CONTINUOUS OUTER SURFACE

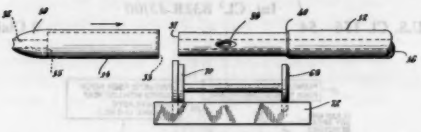
Ahmed Panagrossi, Hamden, Conn., assignor to Quantum, Inc., Wallingford, Conn.

Filed May 5, 1975, Ser. No. 574,384
Int. Cl.² B29C *27/00*; B32B *31/30*; A61M *25/00*
U.S. Cl. 156—229 **9 Claims**

1. A method of producing an inflatable balloon catheter having an inflatable balloon catheter tip attached to a multiple lumen catheter shaft to form a smooth, continuous outer surface at the outer juncture of said tip and shaft, said tip comprising a hollow tubular balloon section defining inside and outside tubular shapes, said method comprising the steps of:

providing mating die members having mold cavity portions which cooperate when said die members are mated together to form a tubular mold cavity having the same tubular shape and size as the balloon section inside tubular shape;

extruding a curable material to form said catheter shaft having the same tubular shape and size as the balloon section outside tubular shape;



axially stretching a portion of said shaft adjacent its leading end while in a partially cured state to reduce the tubular size of said portion;

clamping said shaft portion between said die members in said mold cavity to form said shaft portion with the same tubular shape and size as the balloon section inside tubular shape and to form a shoulder at each juncture of said portion and the remainder of said shaft;

curing said shaft;

stripping said shaft portion from said mold cavity; and

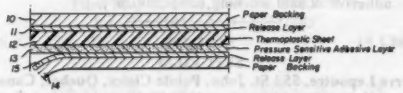
installing said balloon section on said shaft portion.

3,985,602

TRANSFER PROCESS AND COMPOSITE SHEET THEREFOR

James H. Stuart, Pueblo, Colo., assignor to Sangray Corporation, Pueblo, Colo.

Filed Oct. 11, 1974, Ser. No. 513,993
Int. Cl.² B44C *1/16*
U.S. Cl. 156—235 **7 Claims**



1. A process of using a transfer sheet for the transfer of an indicia or image to substrate, which includes:

a. forming a composite transfer sheet which includes a first plastic sheet and a second plastic sheet having a lower melting point then said first plastic sheet and providing a film of tacky contact adhesive on the exposed side of the second plastic sheet and a releasable paper backing at the opposite side of said first plastic sheet;

b. placing said tacky contact adhesive surface of the transfer sheet against the printed indicia or image provided on a sheet of paper and the like;

c. treating said combined transfer sheet and image-provided-sheet in a manner to separate said image-provided-sheet from the indicia;

d. placing said indicia or image carrying surface of the transfer sheet against the surface of a substrate;

e. applying heat through said paper backing and said first plastic sheet to cause said second plastic sheet to fuse with said tacky contact adhesive, with said indicia or image and to said substrate; and

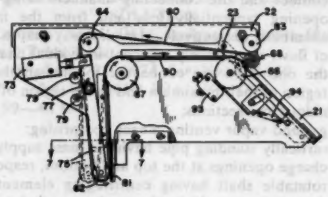
f. separating said paper backing from said first plastic sheet, so that the outer surface of said first plastic sheet will provide a protective layer for said indicia or image bonded to said substrate.

3,985,603

METHOD AND APPARATUS FOR TRANSPORTATION OF A LABEL

George J. Berner, Beavercreek Township, Greene County, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed June 16, 1975, Ser. No. 587,059
Int. Cl.² B65C 9/18
U.S. Cl. 156—235 6 Claims



4. The method of removing a label having one side coated with a pressure sensitive adhesive from a backing strip and transporting said label to an applicator, comprising the steps of:

a. moving said backing material with said label affixed thereto around a sharp edge such that said backing material makes a sharp turn and the stiffness of said label causes said label to pull away from said backing material rather than follow said backing material around said sharp turn,

b. stopping the movement of said backing material after a substantial portion of said label is stripped from said backing material,

c. moving endless belt conveyor means from a first position into contact with the adhesive side of said label to completely strip said label from said backing material,

d. continuing the motion of said conveyor such that said label is firmly engaged thereby, and

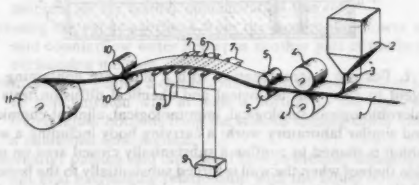
e. conveying said label to the applicator and returning said conveyor means to said first position.

3,985,604

METHOD FOR THE MANUFACTURE OF LAMINATED PACKING MATERIAL CONTAINING METAL FOIL

Gyula Balla, Malmo, Sweden, assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 296,922, Oct. 12, 1972, abandoned. This application July 30, 1974, Ser. No. 493,025
Claims priority, application Sweden, Nov. 26, 1971, 151421/71
Int. Cl.² B23K 13/00; B29B 27/04
U.S. Cl. 156—244 1 Claim



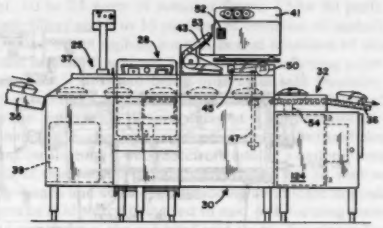
1. Method of manufacturing a laminated packaging material which has at least one thermoplastic layer and one foil layer comprising the steps of: supplying a web of metal foil, extruding a layer of thermoplastic material on the web of metal foil at a temperature between 260° and 280° C, passing the metal foil with thermoplastic material extruded thereon over and in contact with a plurality of metal bars forming an arched path in the direction of travel of the metal foil, generating induction currents in said metal foil as it passes over the bars by passing a high frequency current of 100 kilohertz – 1000 kilohertz through the metal bars to complete the lamination of the thermoplastic material to said web of foil.

3,985,605

LABELING METHOD AND APPARATUS

Fritz F. Treiber, Dayton, and Dallas A. Margraf, Bellbrook, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Apr. 30, 1975, Ser. No. 573,597
Int. Cl.² B32B 31/00
U.S. Cl. 156—384 3 Claims



1. In an apparatus for applying a label having one adherent surface to the bottom of a package and including:

conveyor means for moving a package into proper position over an aperture,

sensing means responsive to proper package position,

printer means for printing and ejecting a label,

catcher means for holding each label after ejection,

applicator means for conveying said label from said catcher means through said aperture to the bottom of said package,

an improved catcher means comprising:

opposed guide walls separated by a distance slightly greater than the width of a label, the inner surfaces of said guide walls being slightly tapered converging toward the bottom of said guide walls,

opposed label support means located beneath said guide walls and forming two knife edge surfaces adjacent said guide walls and spaced closer than said guide walls for supporting an ejected label received between said guide walls, and

stop means for terminating ejection travel of said label in said catcher over said support means and said applicator means.

3,985,606

LOW-PRESSURE DEENTRAINMENT EVAPORATOR

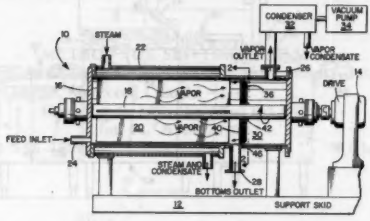
James L. Baird, Winchester, and Max Mendelsohn, Randolph, both of Mass., assignors to Artisan Industries Inc., Waltham, Mass.

Filed Aug. 2, 1974, Ser. No. 494,078
Int. Cl.² B01D 1/22, 3/08
U.S. Cl. 159—6 WH 19 Claims

1. In a method of processing fluid material in a rotary-wiped thin-film-type evaporator apparatus which comprises a plurality of rotor blades secured to a rotor within a processing chamber within a closed chamber, and which includes a vapor chamber, a vapor outlet, a feed inlet at one end and a product outlet remotely spaced downstream from the feed inlet, which method comprises: placing a thin film of said feed material to be heated onto the interior wall of the closed chamber which wall is a surface of revolution through the rotation of the rotor blades by the rotor; heating the thin film on the interior wall of the chamber as it moves from the feed inlet to the product outlet of the apparatus to provide a nonvolatile component and a volatile vapor component having entrained particles of the nonvolatile component therein; removing the nonvolatile

vapor component from the product outlet; and removing the volatile component from the vapor outlet, the improvement which comprises:

a. passing the volatile vapor component containing entrained particles of the nonvolatile component therein, after removal of the nonvolatile component from the product outlet and prior to removal of the volatile component from the vapor outlet, through a pad of deentraining open mesh-type material having an axial depth of about 1 to 12 inches and characterized by about over 90% free space while rotating the mesh material axially about the rotor, and substantially perpendicular to the rotor axis, the voltile vapor component having the entrained nonvolatile components impinging substantially perpendicularly to the mesh-type material to provide for the collection of the entrained components on the mesh-type material, and to permit the deentrained volatile component to pass axially through the mesh-type material to the vapor outlet; and



b. collecting the deentrained particles, by virtue of centrifugal force, from the mesh-type material onto an inner collecting surface about the outer periphery of the mesh-type material, the surface closely spaced from the surface of revolution and secured to the material for rotation therewith, and directing said collected particles in a direction away from the vapor outlet.

3,985,607

APPARATUS FOR REMOVING CONTAMINENTS FROM COCOA AND COCOA BUTTER MASSES

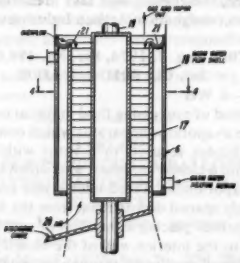
Armin Schmitt, Birkeneck, Germany, assignor to J. S. Petzholdt, Germany

Filed Mar. 18, 1974, Ser. No. 451,880

Claims priority, application Germany, Mar. 19, 1973, 2313563

Int. Cl.² B01D 1/22; B01F 15/00

U.S. Cl. 159—6 W **1 Claim**



1. An apparatus for removing of harmful flavors, odorants or the like from cocoa or cocoa butter masses comprising:

a. a conveying line for the continuous passage of the mass from a supply source to a discharge vessel;

b. a conveying pump positioned in said conveying line;

c. an in-line mixer positioned in said conveying line, said mixer comprising:

a plurality of individual chambers arranged in a series in direction of flow, said individual chambers being connected to one another by supply and discharge channels, the individual chambers having the form of a double truncated cone with their small bases in coaxial contact and the connecting channels being arranged opening tangentially into and from the individual chambers, respectively, in such a way that in direction of flow, alternatively adjacent individual chambers on the one hand are connected to one another in the region of their maximum and in the region of the minimum cross-sections;

d. a gas and vapor venting means comprising:

a vertically standing pipe having a mass supply and discharge openings at the top and bottom, respectively, a rotatable shaft having centrifuging elements affixed thereto in a multi-level arrangement being coaxially provided in said pipe, said elements conforming with the inner walls of the pipe and occupying a cylindrical annular space for the passage of the mass from the top to the bottom and for centrifuging said mass in the form of a film against the pipe walls, centrifuging and peeling elements having peeling mouths facing in the direction of rotation and which are in communication with downwardly directed spray openings via imbedded channels, said spray openings having a lesser spacing from the shaft or pipe axis in relationship to the peeling mouth pieces; said elements (b), (c) and (d) being arranged in series in said conveying line in the order named; and

e. a metering pump in communication with a source of water and arranged to introduce water to said conveying line.

3,985,608

SUPPORTING ELEMENT FOR USE IN MICROBIOLOGICAL, SEROLOGICAL, IMMUNOLOGICAL, CLINICAL-CHEMICAL AND SIMILAR LABORATORY WORK

Rolf Saxholm, Aastadveien 2, 1362 Billingstad, Norway

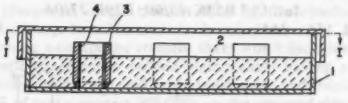
Continuation of Ser. No. 414,939, Nov. 12, 1973, which is a division of Ser. No. 33,594, May 1, 1970, Pat. No. 2,791,930.

This application Aug. 7, 1975, Ser. No. 602,745

Claims priority, application Norway, May 3, 1969, 1832/69

Int. Cl.² C12K 1/10

U.S. Cl. 195—127 **23 Claims**



1. For use in combination with a substrate containing an agent to carry out biological and chemical diffusion tests in microbiological, serological, immunological, clinical-chemical and similar laboratory work: a carrying body including a wall which is shaped to confine a substantially closed area on one side thereof when the wall is forced substantially to the bottom of the substrate, and means associated with said body for diffusing an active substance from said body into the confined area of the substrate for producing a substantial equilibrium concentration of the active substance in said confined area, the reactivity of the active substance and agent being the subject of the investigation, said carrying body and said means associated therewith defining an open cavity at the lower end of said wall through which the substrate is allowed to penetrate into said closed area when the wall of the carrying body is forced substantially to the bottom of the substrate, said means being restricted within said body to the region outside

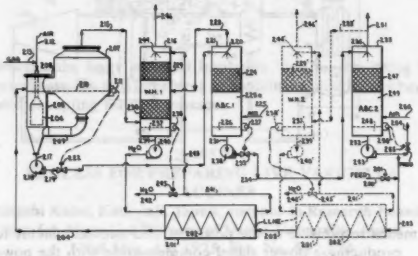
said open cavity to diffuse the active substance from the body into the substrate confined in said closed area along the length of the body corresponding to the depth of penetration of the body into the substrate.

3,985,609

MULTIPLE EFFECT PROCESSES OF CONCENTRATING SOLUTION

Carl A. Connally, Tulsa, Okla., assignor to Ozark-Mahoning Company, Tulsa, Okla.

Filed Oct. 21, 1974, Ser. No. 516,150
Int. Cl.² B01D *1/14, 1/16, 1/00*
U.S. Cl. 159—48 L **10 Claims**



1. A process of concentrating a solution comprising the steps of:

continuously heating a liquid body of the solution to be concentrated in a first vessel to drive off water vapor therefrom and heat the said body to a high temperature in a first heating and vaporizing step;

passing the overhead vapor from said first vessel to a counterflow gas-vapor-liquid direct heat exchange water heater as at least part of the heating medium thereto;

passing the concentrated hot liquid bottoms from said first vessel as the overhead liquid input to a first counterflow cooling tower in gas-liquid contact with ambient air for further concentration thereof;

withdrawing concentrated liquid bottoms from the first cooling tower and passing the liquid bottoms from the first cooling tower as the overhead liquid input to a second counterflow cooling tower in gas-liquid contact with ambient air for further concentration thereof;

passing the vapor overhead from the first cooling tower to said counterflow water heater as another part of the heat exchanging medium thereto;

continuously joining a continuous stream of new solution to be concentrated with at least a portion of the concentrated liquid bottoms from the second cooling tower into a combined flow thereof,

thereafter passing said combined flow in indirect liquid-liquid heat exchanging relationship with the liquid bottoms from the water heater prior to passing said combined flow to said first heating and vaporizing step to be concentrated therein;

passing said combined flow after heat exchange with said water heater bottoms as a continuous feed to said first heating and vaporizing step to replace liquid evaporated therefrom;

passing at least part of said heat exchanged liquid bottoms to the overhead liquid input of said water heater as feed thereto, and

passing concentrated solution out of the system as product.

3,985,610

WATER-RESISTANT ASBESTOS-CEMENT

Robert C. Pomerhn, Cheektowaga, and Robert M. Johnson, Kenmore, both of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,072
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.² D21F *11/00*
U.S. Cl. 162—133 **6 Claims**

1. The method of making an asbestos-cement product of improved water resistance comprising the steps of forming an aqueous slurry of, by weight, from 30 to 50 parts of Portland cement, 10 to 25 parts of asbestos fibers, 10 to 50 parts of inorganic fillers and 2 to 10 parts of an emulsion of asphalt in water, based on an asphalt content in said emulsion of about 60%, said asphalt in said emulsion having a softening point of at least about 150°F and being present in said emulsion in forms substantially all smaller than 10 microns, thoroughly mixing the ingredients of said slurry at a temperature of no more than 110°F, continuously feeding portions of said slurry to means for forming a web therefrom adding a cationic retention aid to the portion of said slurry being fed to said web forming means and subsequently adding an anionic flocculating agent to said slurry being fed to said web forming means, forming a web from the solids of said slurry, forming a laminated product from a plurality of said webs, and curing and hardening said product.

3,985,611

WHOLLY INOGANIC PAPERS AND MEMBRANES SUITABLE FOR ION EXCHANGE MADE OF THORIUM ACID PHOSPHATE AND PROCESS FOR PREPARING THE SAME

Giulio Alberti, and Umberto Costantino, both of Rome, Italy, assignors to Comitate Nazionale per l'Energia Nucleare, Rome, Italy

Filed July 15, 1971, Ser. No. 163,091
Int. Cl.² D21H *5/12*
U.S. Cl. 162—157 R **2 Claims**

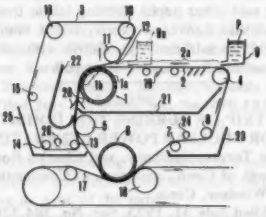
1. Inorganic papers for ion exchange, wherein the basic texture of the paper is fibrous thorium acid phosphate with a molar ratio PO_4 Th in the solid ranging from 1.9 to 2.1.

3,985,612

PAPER MAKING SYSTEM INCLUDING FORMING FABRICS AND POROUS FORMING CYLINDERS

Kazumasa Watanabe, 82-1, Iriyamase, Fuji, Shizuoka, Japan

Continuation-in-part of Ser. No. 421,798, Dec. 5, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,824
Claims priority, application Japan, Mar. 12, 1973, 48-28782
Int. Cl.² D21F *9/02, 11/04*
U.S. Cl. 162—203 **2 Claims**



1. A method of forming a paper web from a slurry material without the use of suction boxes, said method comprising:

passing an inner paper forming fabric in mesh form over an arc surface of the outer circumference of a first rotatable

porous cylinder roll, said inner paper forming fabric having a straight moving section extending tangentially to the uppermost position of said first roll;

passing an outer paper forming fabric in mesh form overlapping said inner paper forming fabric along the outer circumference of said first roll and forming with said inner paper forming fabric along a portion of the outer circumference of said first roll a paper layer forming area, said outer paper forming fabric extending tangentially to said uppermost portion of said first roll at an angle to said inner paper forming fabric;

directing a slurry of paper forming material onto said straight moving section of said inner paper forming fabric at a location before it closes with said outer paper forming fabric and thereon dehydrating said slurry by the action of gravity and without suction boxes to form a partly dehydrated slurry, with the fibres at the bottom thereof oriented in the direction of travel of said inner paper forming fabric;

moving the partly dehydrated slurry into the closing area formed between said inner and outer paper forming fabrics and subjecting the partly dehydrated slurry to turbulence such that the fibres at the top thereof become randomly oriented;

moving said partly dehydrated slurry over the surface of said first roll through said paper layer forming area while compressing said partly dehydrated slurry between said inner and outer paper forming fabrics as it is moved over the surface of the cylinder, and removing additional moisture therefrom entirely by the compressing action of said inner and outer paper forming fabrics and the centrifugal force action produced by the movement of the dehydrated slurry around the surface of said first roll, and thereby forming a paper web from the thus dehydrated slurry;

passing said inner and outer paper forming fabrics with said paper web therebetween tangentially from said first roll and tangentially over a portion of the outer surface of a transfer roll;

separating one of said inner and outer paper forming fabrics from said paper web and the other of said paper forming fabrics, while maintaining said paper web on said other paper forming fabric without the application of suction from said transfer roll;

passing said other paper forming fabric with said paper web over an arc surface of the outer circumference of a second rotatable porous roller;

passing a conveyor fabric, in overlapping manner over said other paper forming fabric with said paper web therebetween, along said arc surface of said second roll, and removing still remaining moisture from said paper web by the centrifugal force of said second roll and the surface pressure of said conveyor fabric and said other paper forming fabric;

passing said conveyor fabric and said other paper forming fabric with said paper web therebetween over a portion of the outer circumference of a biasing roll; and

separating said other paper forming fabric from said paper web and said conveyor fabric, while maintaining said paper web on said conveyor fabric without the application of suction from said biasing roll.

3,985,613

REACTOR TRIP ON TURBINE TRIP INHIBIT CONTROL SYSTEM FOR NUCLEAR POWER GENERATING SYSTEM

Jose Marcelo Torres, Simsbury, and Charles Ronald Musick, Vernon, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed July 31, 1973, Ser. No. 384,330

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.[2] G21C *19/00*

U.S. Cl. 176—20 R **10 Claims**

1. A nuclear power generating system comprising:

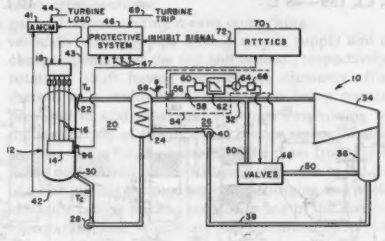
coolant vapor generating apparatus including a nuclear reactor;

a turbine for receiving coolant vapor produced by said vapor generating apparatus;

coolant circuitry for said coolant vapor generating apparatus and said turbine including means for delivering vapor to said turbine;

a plurality of coolant vapor relief valves in said coolant circuitry, at least one of said valves being operable automatically to divert coolant vapor from said turbine;

a protective system independently responsive to a plurality of signals to cause said nuclear reactor to trip, at least one of said signals being indicative of the occurrence of a turbine trip;



means responsive to the power of said nuclear reactor for producing a power signal commensurate with the power of said nuclear reactor;

means for producing a capability signal commensurate with the capability of said coolant vapor relief valves to divert coolant vapor;

means responsive to a plurality of inputs including said power signal and said capability signal for producing an inhibit signal only when the capability of said coolant vapor relief valves is greater than the power of said nuclear reactor; and

means responsive to said inhibit signal for preventing said protective system from responding to a signal indicative of a turbine trip.

3,985,614

NUCLEAR REACTOR INSTALLATION

Axel Jungmann, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

Filed July 25, 1974, Ser. No. 491,666

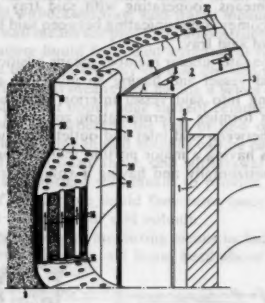
Claims priority, application Germany, July 27, 1973, 2338337

Int. Cl.[2] G21C *13/04*

U.S. Cl. 176—87 **4 Claims**

1. A nuclear reactor installation comprising a reactor pressure vessel made of metal, a concrete containment wall surrounding said vessel and forming an annular space around the vessel, thermal insulation in said space and surrounding said vessel, and a coolant-conductive layer in said space and surrounding said insulation, said insulation and layer substantially filling said space and compressively providing zero-excursion rupture safeguarding for said vessel during reactor operation;

wherein the improvement comprises said layer being formed by blocks laid together and having coolant passages, interfaces being formed between said layer and said concrete wall and



between the layer and said insulation, and mortar being injected between said interfaces and solidified, said blocks being solid excepting for said passages.

3,985,615

PROCESS FOR PREPARING LIVE VARICELLA VACCINES

Takashi Kubo, Kannonji, Japan, assignor to Research Foundation for Microbial Diseases of Osaka University, Japan

Filed Mar. 12, 1975, Ser. No. 557,724

Claims priority, application Japan, Mar. 12, 1974, 49-29318

Int. Cl.² C12K *5/00, 7/00;* **A61K** *39/12*

U.S. Cl. 195—1.3 **4 Claims**

1. A process for the attenuation of varicella virus comprising passaging the varicella virus in a guinea pig primary embryonic tissue cell at a temperature of 32° – 37° C until the virus is adequately attenuated.

3,985,616

IMMOBILIZATION OF ENZYMES WITH A STARCH-GRAFT COPOLYMER

Mary Ollidene Weaver, Peoria; Edward B. Bagley, Morton; George F. Fanta, Peoria, and William M. Doane, Morton, all of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 456,911, April 3, 1974, Pat. No. 3,935,099. This application Sept. 8, 1975, Ser. No. 611,459

Int. Cl.² C07G *7/02*

U.S. Cl. 195—63 **11 Claims**

1. A method of preparing an immobilized enzyme composition comprising:

a. providing an aqueous-fluid-absorbing composition comprising water-insoluble alkali salts of aqueous alkali saponified gelatinized-starch-polyacrylonitrile graft polymers, which alkali salts were prepared by saponifying the product resulting from graft polymerization of acrylonitrile onto gelatinized starch, and which alkali salts contain gelatinized starch (GS) and saponified polyacrylonitrile (HPAN) in molar ratios of from about 1:1.5 to 1.9 GS:HPAN, said water-insoluble alkali salts of aqueous alkali saponified gelatinized-starch-polyacrylonitrile graft polymers being water-insoluble solids capable of absorbing in excess of 300 parts of water per part of said water-insoluble solids;

b. mixing a solution of enzyme with the aqueous-fluid-absorbing composition whereby the solution of enzyme is absorbed into the fluid-absorbing composition thereby swelling said composition; and

c. adding to said swollen composition an amount of water-soluble mineral salts sufficient to shrink the composition to an extent sufficient to entrap the enzyme within its matrices.

3,985,617

IMMOBILIZATION OF BIOLOGICALLY ACTIVE PROTEINS WITH A POLYPEPTIDE AZIDE

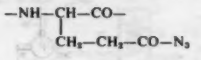
Yasumi Yugari, Kamakura, and Yoshiki Minamoto, Chigasaki, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Oct. 29, 1974, Ser. No. 518,383

Int. Cl.² C07G *7/02*

U.S. Cl. 195—68 **7 Claims**

1. A method of producing a biologically active composition which comprises contacting modified poly-γ-methyl glutamate including azide groups in repeating units of the formula



with an enzyme, said enzyme being a protein having an amino acid unit including an amino group in position α or ω, until an immobilized enzyme is formed by covalent bonds established by reaction between the azide groups of said modified poly-γ-methyl glutamate and said enzyme.

3,985,618

METHOD FOR DETECTION OF THROMBOSIS AND PRETHROMBOSIS

Irving Innerfield, 20 Knickerbocker Road, Tenafly, N.J. 07670

Continuation-in-part of Ser. No. 574,181, May 2, 1975, abandoned. This application Oct. 24, 1975, Ser. No. 625,628

Int. Cl.² C12K *1/04*

U.S. Cl. 195—103.5 R **9 Claims**

1. A method of measuring serum coagulability in a patient comprising the steps of adding heparin in different amounts to aliquots of serum from a patient, adding each of the resultant heparin-serum solutions to a separate tube containing thrombin solution, reacting a portion of each of the resultant thrombin-heparin-serum solutions with normal plasma solution to determine whether clotting occurs, and in the event clotting occurs, determining the clotting time, all steps being carried out under standardized conditions at at least one selected temperature, thereby making it possible to compare the measured clotting times with clotting time ranges obtained under standardized conditions with serum from healthy unmedicated individuals and from known thrombotic individuals, and to establish whether the measured clotting times fall within a first normal range corresponding to normal, unmedicated individuals, a second low range corresponding to thrombotic individuals, or third and fourth ranges intermediate said normal and low ranges and corresponding to individuals of increasing coagulability, a low clotting time correlating with high serum coagulability.

3,985,619

EXPLORATION METHOD AND APPARATUS UTILIZING ATMOSPHERIC MICRO-ORGANIC PARTICULATES

Anthony Rene Barringer, Willowdale, Canada, assignor to Barringer Research Limited, Rexdale, Canada

Filed July 19, 1974, Ser. No. 490,153

Int. Cl.² C12K *1/04, 1/06*

U.S. Cl. 195—103.5 R **6 Claims**

1. A method of prospecting for mineral deposits, hydrocarbon accumulations and geothermal sources comprising:

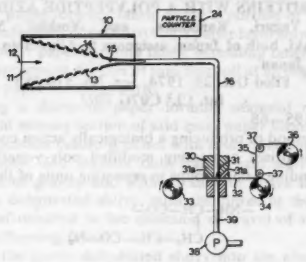
a. traversing an area of the earth,

b. collecting particulate matter contained in the atmosphere above the earth, said particulate matter containing microorganisms and said particulate matter being collected at a plurality of different positions in said area,

c. determining the geographical location of each different position in which said particulate matter was collected,

d. concentrating said particulate matter immediately after it has been collected,

e. storing said particulate matter in a medium that is adapted to maintain the viability of the micro-organisms contained therein,



f. applying a nutrient to said particulate matter and incubating at least a portion of said micro-organisms, whereby said micro-organisms are caused to multiply, and

g. observing the locations on said medium at which anomolous growths of said micro-organisms have occurred, and correlating said locations on said medium with said geographical locations.

3,985,620

SUBSTRATE FOR DETERMINING PROTEINASE

Hermann Erich Karges, Marbach near Marburg an der Lahn, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Germany

Filed Dec. 19, 1974, Ser. No. 534,166

Claims priority, application Germany, Dec. 21, 1973, 2363854

Int. Cl.² C12K *1/04*

U.S. Cl. 195—103.5 R **15 Claims**

1. A substrate for determining proteinases which comprises a substrate protein bound by covalent bonding to a solid polymer carrier and dyed with a reactive dyestuff.

3,985,621

STOPPING AGENTS FOR ENZYME REACTIONS OF DEHYDROGENASE SYSTEMS

Motohiro Maruyama, and Keiko Yamamoto, both of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Oct. 21, 1975, Ser. No. 624,557

Claims priority, application Japan, Oct. 23, 1974, 49-122243

Int. Cl.² C12K *1/00*

U.S. Cl. 195—103.5 R **24 Claims**

1. A method for stopping an enzyme reaction of a dehydrogenase or a dehydrogenase system in a spectrophotometric assay method of an activity of serum enzyme in said enzyme or enzyme system which comprises applying as a stopping agent for said enzyme reaction an aqueous alkali solution of cyclohexylaminopropanesulfonic acid having a concentration of 0.1 - 2M and a pH value of 10.5 - 12.5.

3,985,622

METHOD AND APPARATUS FOR CONDUCTING FERMENTATION

Harold M. Hawkins, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 30, 1975, Ser. No. 545,547

Int. Cl.² C12B *1/16*

U.S. Cl. 195—142 **10 Claims**

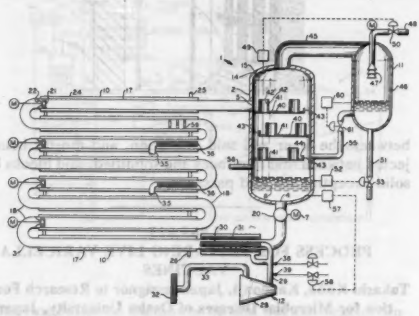
1. A fermentation apparatus comprising:

a. a vessel having a hollow interior;

b. a tray having a top side and bottom side and being positioned in said vessel and disposed generally horizontally and having a plurality of openings therethrough;

c. first means cooperating with said tray and forming a downcomer communicating between said top and bottom sides of said tray;

d. an elongate tubular member means positioned externally of said vessel and having an inlet and an outlet each opening into said vessel interior, said tubular member means forming a fermentation zone and having a flow path between said inlet and outlet, said tubular member means having a major portion thereof positioned generally horizontally and having a volume greater than the



volume of the vessel, said outlet opening into said vessel above said tray and said inlet opening into said vessel below said tray;

e. a pump cooperating with the tubular member means operable for inducing fluid flow therethrough from said inlet to said outlet;

f. a heat exchanger positioned externally of said vessel and cooperating with the exterior of said tubular member means for removing heat from same and fluid flowing therethrough with said heat exchanger extending substantially along the length of said tubular member means between the inlet and outlet; and

g. an injector opening into said tubular member means adjacent the inlet and operable for introducing oxygen into said fluid.

3,985,623

COLUMN MATERIAL BALANCE CONTROL RESPONSIVE TO DIFFERENTIAL PRESSURE OVER A COLUMN WITHDRAWAL TRAY

Barry S. Morgan, Concord, and Richard P. Sandell, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 7, 1974, Ser. No. 449,150

Int. Cl.² B01D *3/42*; C10G *7/02*

U.S. Cl. 196—132 **7 Claims**

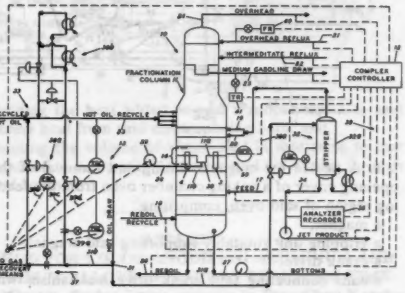
1. In a fractionation process system having a fractionation column including inlet means for introducing one feed stream to said column, outlet means for withdrawing at least one stream from said column in addition to conventional distillate and bottom product streams, control means for optimizing and stabilizing process variable within preselected setpoint limits including exterior processes associated with said fractionation column, comprising in combination,

A. metering means operative at said withdrawal zone of said column between a withdrawal tray and an adjacent fractionation tray interconnected by downcomer means whereby, in operation, liquid flow cascading, by gravity, from said withdrawal tray to said adjacent fractionation tray via said downcomer means, can be accurately mea-

sured as a function of time, said metering means comprising:

i. weir means including frame means mounted in alignment with said downcomer means at an intersection with said withdrawal tray, said frame means including upright wall means for providing an obstruction to flow of cascading liquid from said withdrawal tray to said adjacent fractionating tray via said downcomer means, said upright wall means also having a series of notches spaced along an upper edge thereof remote from said withdrawal tray whereby the rate of flow of said cascading liquid through said notches can be calibrated in terms of liquid head above said withdrawal tray adjacent to said upright wall means to provide, in toto, a range of measurable liquid flow rates associated with efficient operations of said column,

ii. differential pressure measuring means including sensor means for measuring said liquid head above said withdrawal tray adjacent to said upright wall means as a function of differential pressure, said differential pressure measuring means producing a signal proportional thereto,



iii. means for indicating said signal so that when deviations from cascading liquid flow rate setpoint limits occur, correction operators can be quickly generated by a complex controller so as to reestablish optimal and stable processing conditions within sid fractionation system,

B. Respective control means connected to said inlet and outlet means of said fractionating column for controlling flow of said one stream introduced into said column and said at least one stream withdrawn from said column, responsive to said correction operators; at least one of said respective control means including separate sensing means adapted to sense conditions of one of said at least one stream, which is withdrawn from an intermediate withdrawal zone of said column.

3,985,624

DEVICE FOR CONTINUOUS SAMPLING, ESPECIALLY IN A DISTILLATION COLUMN FOR TOPPING CRUDE PETROLEUM

Michel Prevost, Heyrieux, and Bernard Vourron, Oullins, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf, Paris, France

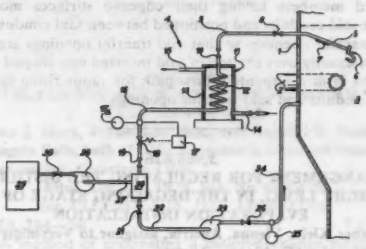
Filed May 27, 1975, Ser. No. 581,347

Claims priority, application France, May 30, 1974, 74.18871

Int. Cl.² B01D *3/42*; C10G *7/10*; G01N *33/22*

U.S. Cl. 196—132 **1 Claim**

1. A distillation column having a device for the continuous sampling of a vaporized fraction of crude petroleum, said device comprising sampling means directly connected to said column and including a sampling tube of substantial length which penetrates transversely into the column in that region of the column in which expansion and vaporization of the greater part of the crude petroleum takes place, said tube being open at that extremity which penetrates into the column and being provided with means for limiting the velocity of the vapor collected in the sampling tube and separating the liquid fraction which may have been entrained, a condenser located outside the column and connected to the sampling tube for condensing the sampled vapor and pipe means including a filter mounted at the outlet of the condenser and a circulating pump for returning the condensate to the column and withdrawing means connected to said filter means for withdrawing a portion of the condensate to supply an analyzing device, said



means for limiting the velocity of the vapor collected in the sampling tube comprising an end piece mounted at the open extremity of the sampling tube within the column and including a casing having an annular wall and side walls, said annular wall being provided with vapor inlet and one of said side walls having outlet means connected to and communicating with said open extremity of said sampling tube, baffle means secured to said side walls within said casing and comprising a pair of coaxially opposed overlapping spaced apart annular collars and drain means comprised of a curved outlet pipe connected to the other of said side walls of said casing adjacent the bottom thereof to form a draintrap siphon.

3,985,625

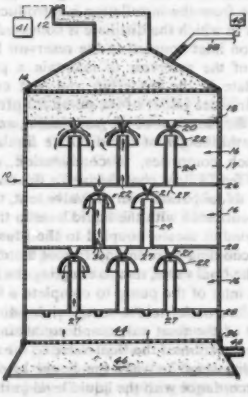
ALCOHOLIC BEVERAGE STILL WITH DOMED CONDUITS FOR VAPOR FLOW AND FRUSTUM APERTURES FOR CONCURRENT VAPOR/LIQUID FLOW

Miguel J. Fernandez Bjerg, 652 Hernandez St., Muamar, P.R. 00907

Filed Feb. 28, 1975, Ser. No. 554,183

Int. Cl.² B01D *3/14*

U.S. Cl. 202—158 **9 Claims**



1. A fractionating column for distilling liquid comprising a vertical walled structure defining inlet means and outlet

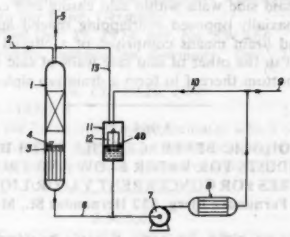
means, a perforated plate means horizontally mounted across said walled structure, a first feed plate defining a plurality of transfer openings horizontally extending across said walled structure below said perforated plate means, a second feed plate horizontally extending across said walled structure and positioned below said first feed plate, said second feed plate defining a plurality of vapor feed openings and a plurality of transfer openings, a plurality of conduits communicating with said second feed plate in alignment with the vapor feed openings, each of said conduits being positioned around one of said feed openings to allow vapor to pass therethrough into a chamber formed by the walls of said vertical structure and said first and second feed plate, and a plurality of inverted cup shaped members having their concave surfaces mounted above said conduits and positioned between said conduits and said transfer openings so that said transfer openings are positioned exactly over the top of said inverted cup shaped members to form a serpentine flow path for vapor rising through said conduits and said transfer openings.

3,985,626

ARRANGEMENT FOR REGULATING THE DISTILLATE HEIGHT LEVEL IN THE DEGASSING STAGE OF AN EVAPORATION INSTALLATION

Guenther Klein, Vienna, Austria, assignor to Vereinigte Edelstahlwerke AG, Vienna, Austria

Filed Dec. 5, 1974, Ser. No. 529,977
Claims priority, application Austria, Dec. 7, 1973, 10280/73
Int. Cl.² B01D *3/00, 19/00*
U.S. Cl. 202—202 **2 Claims**



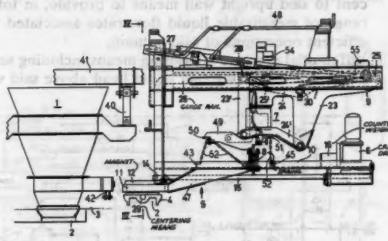
1. An evaporation installation having a degassing stage to which distillate from the installation is introduced and which has a reservoir in which the distillate is collected, and a pump having a suction inlet coupled to the reservoir for propelling distillate out of the reservoir to maintain a predetermined level of distillate in the reservoir, and first conduit means coupled to a pressure outlet of the pump for propelling a first portion of the distillate out of the installation, an arrangement for regulating the height of the distillate liquid level in the reservoir, which comprises, in combination, a float valve having a valve seat, a float chamber and a float movable in the float chamber to cooperate with the valve seat, the float being movable in accordance with the liquid level in the float chamber, second conduit means coupled to the pressure outlet of the pump for coupling a second portion of the distillate to the valve seat of the float valve, means coupling the float chamber to the suction inlet of the pump to complete a feedback path from the pressure outlet to the suction inlet directly through the valve seat of the float valve, and equalizing means coupling the upper portion of the float valve to the upper portion of the degassing stage to vary the liquid level in the float chamber in accordance with the liquid level in the reservoir so that when the liquid distillate rises above a predetermined level in the reservoir said float closes said valve seat.

3,985,627

DEVICE FOR MAGNETIC LIFTING AND REMOVAL OF THE FEED OPENING COVER OF A COKING CHAMBER OVEN

Günter Gebhardt, Dortmund, and Josef Peters, Bochum, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Apr. 12, 1974, Ser. No. 460,464
Claims priority, application Germany, Apr. 12, 1973, 2318345
Int. Cl.² C10B *35/00, 25/24*
U.S. Cl. 202—262 **6 Claims**



1. A device for magnetic lifting and removal of the feed opening cover of a coking chamber oven from the feed opening region of said oven, comprising

a magnet,

a gripping unit rotatably supporting said magnet,

a crank drive,

means connecting said crank drive mechanism with said magnet for rotary movement of said magnet in relation to said gripping unit,

a lower horizontal transverse frame member carrying the magnet and gripping unit at one end and carrying said crank drive at the opposite end with said connecting means carried on the frame member and extending between the drive and the magnet,

a slide means supporting the transverse frame member intermediate its ends,

a guide rail for said slide means and transverse frame member guiding the movement of the slide means and transverse frame member in a vertical plane extending through the cover, said guide rail including a vertical branch and a horizontal branch extending laterally away from the feed opening of the oven, the branches of the guide rail being continuous with each other, and

drive means for said slide means,

said vertical branch first limiting lifting movement of said transverse frame and magnet vertically, said horizontal branch limiting movement of said transverse frame and magnet horizontally from the region of said feed opening all in said vertical plane,

said vertical branch preventing horizontal movement of said slide means in a horizontal direction until the frame is in its fully raised position.

3,985,628

POLLUTION CONTROL IN ELECTROPLATING SYSTEMS

Lyle R. Myers, 5227 Martin Road, Corunna, Mich. 48817

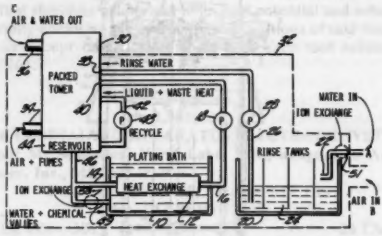
Filed Aug. 4, 1975, Ser. No. 601,466
Int. Cl.² C25D *3/00, 21/04*
U.S. Cl. 204—14 R **10 Claims**

1. In an electroplating process wherein the heat generated is in excess of that required to maintain the temperature of the electroplating bath, wherein the electroplate is rinsed with water, wherein fumes above said bath are swept with air to a scrubber to contact process liquid flowing through said scrubber in a manner to transfer water from said scrubber liquid to

said air and to transfer chemical values from said air to said scrubber liquid, to produce a substantially water-saturated air and a concentrated liquid with enhanced chemical values, the improvement which comprises:

a. limiting said scrubber liquid substantially to rinse water;

b. limiting said air flow substantially to that required to sweep said fumes from above said bath to said scrubber;



c. limiting the heat added to said scrubber liquid to said excess heat from said electroplating bath; and

d. limiting the volume of water used in said rinse to that required to substantially saturate said air moving through said scrubber.

3,985,629

METHOD FOR COLOR-ANODIZING ALUMINUM AND ALUMINUM ALLOYS IN A SHORT PERIOD OF TIME

Shozo Kimura, Osaka, Japan, assignor to Toyo Chuo Kagaku Kenkyusho, Japan

Filed June 18, 1975, Ser. No. 588,009
Claims priority, application Japan, June 29, 1974, 49-74633
Int. Cl.² C25D *11/10*
U.S. Cl. 204—58 1 Claim

1. A method for color-anodizing aluminum and aluminum alloys to form a colored oxide coating comprising subjecting the surfaces of said aluminum and aluminum alloys to anodic oxidation with D.C. current having a density of 0.5 – 2.0 A/dm² in an electrolyte which contains 5 to 100 g/lit of electrolyte of citric acid or succinic acid, 1 to 30 g/lit of electrolyte of sulfosalicylic acid or sulfophthalic acid and 1 to 5.0 ml/lit of electrolyte of sulfuric acid.

3,985,630

METHOD OF EXTRACTING METALS FROM SPENT ELECTRIC STORAGE BATTERIES

Marco Ginatta, Corso Alberto Picco, 35, Turin, Italy

Filed July 21, 1975, Ser. No. 584,833
Claims priority, application Italy, July 25, 1974, 69363/74; Dec. 30, 1974, 70770/74
Int. Cl.² C25B *1/00*; C25F *5/00*; C25C *1/18*
U.S. Cl. 204—96 16 Claims

1. A method of extracting lead from the positive electrodes, negative electrodes, and electrical connections of spend lead-acid electric storage batteries, which comprises the steps of:

recharging the spend lead-acid batteries to reduce the $PbSO_4$ content thereof;

removing sulphuric acid from the recharged batteries;

opening the battery containers to gain access to all battery electrodes;

washing the electrodes and the inside and outside of the battery containers with water;

drying the washed batteries;

immersing the batteries in an electrolyte so that all battery electrodes are simultaneously in contact with the electrolyte, which is a sulfamate-based aqueous solution or an aqueous solution of acetates and sulfates; and

circulating the electrolyte inside and outside the battery containers;

each immersed battery being an electrochemical system composed of a series of electronically connected positive and negative couples of electrodes all all immersed in the same electrolyte in which the negative electrodes naturally anodically dissolve to release lead ions into the electrolyte and electrons which go to the positive electrodes and reduce Pb^{++++} to Pb^{++}, which dissolves in the electrolyte as lead complex.

3,985,631

PRETREATMENT AND START-UP OF ELECTROLYTIC CELL MEMBRANES

Charles J. Hora, Willoughby Hills, and Andrew D. Babinsky, Chagrin Falls, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Aug. 13, 1975, Ser. No. 604,429
Int. Cl.² C25B *1/16, 1/26, 13/00, 15/00*
U.S. Cl. 204—98 7 Claims

1. A method of pretreating a cation-exchange membrane and commencing electrolysis of an alkali metal chloride solution with said membrane, which method comprises the following sequence of steps:

a. immersing said membrane in an aqueous alkali metal hydroxide solution for a period of time sufficient to introduce hydrated alkali metal ions substantially throughout said membrane,

b. withdrawing the thus-treated membrane from said solution,

c. substantially drying the surfaces of the membrane,

d. subsequently mounting the treated, dried membrane between the anode and cathode compartments of an electrolytic cell, thereby separating said compartments,

e. introducing aqueous alkali metal hydroxide to the cathode compartment and aqueous alkali metal chloride to the anode compartment,

f. imposing a potential not in excess of 8.5 volts across said cell,

g. immediately passing a direct current through said membrane between the anode and cathode of said cell, and

h. regulating the voltage to maintain the desired current density.

3,985,632

SMALL, POROUS POLYACRYLATE BEADS

Alan Rembaum; Shiao-Ping Siao Yen, and William J. Dreyer, all of Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 434,124, Jan. 17, 1974. This application Oct. 4, 1974, Ser. No. 512,111
Int. Cl.² C08F *8/00, 226/00*
U.S. Cl. 204—159.15 13 Claims

1. A method of preparing uniformly-shaped, porous, round beads having an average diameter below 2 microns comprising the steps of:

copolymerizing a polymerizable mixture of an amino- or hydroxy-substituted acrylic monomer and a minor amount of a polyunsaturated cross-linking agent in aqueous medium containing 0.05 to 5% by weight of an aqueous soluble polyether by applying high energy radiation to the mixture; and

recovering said beads.

3,985,633

DEVICE FOR THE POLAROGRAPHIC MEASUREMENT OF OXYGEN PRESSURE

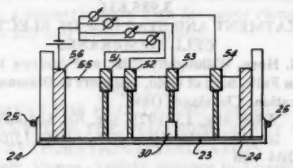
Dietrich W. Lubbers, Dortmund, and Albert Huch, Marbach, Marburg, both of Germany, assignors to Eschweiler & Co., Kiel, Germany

Continuation of Ser. No. 414,538, Nov. 9, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 568,111

Claims priority, application Germany, Nov. 11, 1972, 2255382

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 P 9 Claims



1. A device for the polarographic measurement of the partial pressure of oxygen in a sample, comprising an anodic reference electrode, means for positioning the device on the sample including a plurality of cathodic sensor electrodes each having oxygen-sensing end portions at spaced locations in a common plane for detecting the presence of oxygen diffused from the sample at each of said spaced locations, means for measuring the quantity of oxygen diffused from the sample including a cathodic measuring electrode having an oxygen-measuring end portion located inwardly of said plane, means for covering said electrodes including an oxygen-permeable membrane having a thickness which tends to slow the oxygen flow from the sample towards said measuring electrode so that the latter measures the partial pressure of oxygen, means connected between said anodic reference electrode and said sensor electrodes for monitoring the oxygen flow towards each of said spaced oxygen-sensing end portions so as to determine the proper application of said membrane on the sample, and means connected between said anodic reference electrode and said measuring electrode for indicating the partial pressure of oxygen in the sample.

3,985,634

ELECTROLYTIC SILVER RECOVERY APPARATUS

Kay R. Larson, 1550 Columbia Ave., Pomona, Calif. 91766; John Drew, 541 40th St., Richmond, Calif. 94805, and Howard Ott, 124 Old Mill Road, Great Neck, N.Y. 11023

Filed Jan. 27, 1975, Ser. No. 544,210

Int. Cl.[2] C25C *1/20, 7/00, 7/02, 7/08*

U.S. Cl. 204—212 18 Claims

8. Apparatus for electrolytically recovering silver from a photographic processing solution or the like comprising:

a tank for receiving said solution;

a cathode adapted to extend around the inner periphery of said tank for immersion in said solution;

a lid removably mountable on said tank;

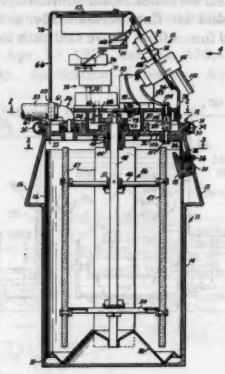
an anode;

means on said lid supporting said anode for immersion in said solution and for rotation about an axis;

a power unit removably mountable on said lid;

a motor carried by said power unit; and

means operatively connecting said motor to said anode when said power unit is mounted on said lid and for



disconnecting said motor from said anode when said power unit is removed from said lid.

3,985,635

APPARATUS FOR CONCURRENTLY SPUTTERING DIFFERENT MATERIALS

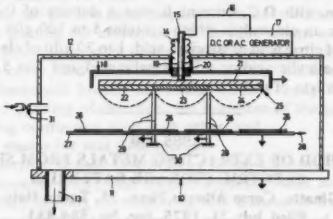
Helmut Adam; Hans Lutz, both of Stuttgart, and Gert Siegle, Hildesheim, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 1, 1974, Ser. No. 438,792

Claims priority, application Germany, Feb. 16, 1973, 2307649

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—298 6 Claims



1. Apparatus for concurrent sputtering of different materials, comprising:

a vessel capable of being evacuated and provided with means for evacuation and for admitting a small quantity of a gas for sustaining a glow discharge;

means, including a common anode electrode, for supporting a plurality of substrates (26) to be sputtercoated;

a single composite cathode (25) formed of portions of materials (22, 23, 24) of different compositions respectively having surfaces in which each of said materials is exposed to a glow discharge during operation of said apparatus;

means for applying cathodic potential to said cathode with respect to said substrates, so as to cause said materials to be simultaneously sputtered in a single glow discharge;

electrically conducting first stainless steel sheet metal shielding means (29) extending to within a few millimeters of the surfaces of said cathode (25) and spaced

sufficiently to prevent electrical breakdown for preventing sputtering of one cathode material on a surface of the cathode consisting of another material, said shielding means being disposed in front of the cathode substantially perpendicularly to the surfaces of the cathode (25) and of the substrates (26) and being substantially aligned with the mutual boundaries of said exposed materials of different compositions of the cathode, and

second shielding means (18) connected electrically to said first shielding means and to ground potential and substantially enclosing the totality of said portions of said materials except on the side where they face said substrates (26).

3,985,636

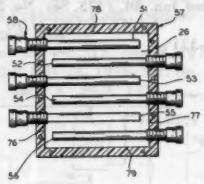
ELECTRODIALYSIS APPARATUS ELECTRODE SYSTEM

Burnett M. Schneider, Wind Lake, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Filed Sept. 26, 1975, Ser. No. 617,189

Int. Cl.² B01D *13/02*

U.S. Cl. 204—301 **26 Claims**



1. Electrodialysis apparatus comprising:

an anode compartment and a cathode compartment spaced from each other.

a plurality of ion permeable membrane means spaced from each other between said anode and cathode compartments to define a plurality of enclosed compartments for fluids,

at least one of said anode and said cathode compartment having a plurality of elongate electrode means extending therein, and

holder means mounted to said compartment, said holder means supporting each said electrode means and disposing a portion of said electrode means inside of said one compartment,

said holder means including means for sealing said electrode means relative to said compartment.

3,985,637

PROCESS FOR SEPARATING AND RECOVERING LIQUID PRODUCTS FROM SOLID AND LIQUID SUBSTANCES

Kindred L. Storrs, 881 Second Ave., Salt Lake City, Utah 84103

Filed May 22, 1974, Ser. No. 472,431

Int. Cl.² C10G *1/02*

U.S. Cl. 208—8 **11 Claims**

1. A process for educating and removing useful products from a substance, said process comprising, forming said substance into a substantially horizontal bed on a perforate support, said bed having a thickness of up to about 1 inch; providing a substantially closed space of substantially constant volume above said bed, said space containing a substantially inert atmosphere which is in contact with said bed and will not support combustion of the materials in said bed; heating the substance to progressively increasing temperatures by means of a radiant heat source located at the top of said closed space and spaced above the upper surface of said substance a distance of up to about 1½ inches, said temperatures being no greater than will progressively cause liquid and gaseous products to form substantially at the substance, while maintaining said atmosphere in said closed space in a substantially static condition; and removing the liquid and gaseous products, substantially as and when produced, from the bottom side of said bed through said perforated support to a collection chamber located below said bed, with any gases withdrawn from said bed being released from said collection chamber to substantially atmospheric conditions, and with the release opening to said atmospheric conditions being located below the bottom side of said bed.

3,985,638

HIGH QUALITY BLENDED JET FUEL COMPOSITION

Merritt C. Kirk, Jr., McKinney, Tex., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Jan. 30, 1974, Ser. No. 437,596

The portion of the term of this patent subsequent to Jan. 29, 1991, has been disclaimed.

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² C10L *1/04*

U.S. Cl. 208—15 **9 Claims**

1. A composition having a freezing point lower than −40°F, comprising a blend of (A) a straight-run paraffinic kerosene in which the aromatic hydrocarbons have been reduced to provide a smoke point greater than 28 and (B) in the range of 23.5 to 40 volume percent of n-decane.

3,985,639

CATALYTIC CRACKING PROCESS

Robert M. Suggitt, Wappingers Falls, N.Y., and Peter L. Paull, Weston, Conn., assignors to Texaco Inc., New York, N.Y.

Filed July 19, 1974, Ser. No. 489,878

Int. Cl.² C10G *11/18*; B01J *29/38*

U.S. Cl. 208—120 **28 Claims**

1. A process for catalytically cracking a hydrocarbon feedstock contaminated with vanadium which comprises:

a. contacting said feedstock with a crystalline aluminosilicate cracking catalyst under catalytic cracking conditions thereby effecting conversion of at least a portion of said feedstock to lighter hydrocarbons and depositing coke and vanadium on said catalyst;

b. regenerating said catalyst by contacting at a temperature of from about 900° to 1350°F. with an amount of oxygen sufficient to effect combustion of at least 85 percent of said coke to gaseous products comprising carbon monoxide and carbon dioxide in a ratio of carbon monoxide to carbon dioxide of at least 1:4 thereby providing a reducing atmosphere during regeneration and detering formation of pentavalent vanadium on said catalyst;

c. contacting said regenerated catalyst of (b) with molecular chlorine wherein said vanadium is converted to a volatile chloride of vanadium and separating said chloride from said catalyst; and

d. contacting said feedstock with said catalyst of (c) under catalytic cracking conditions as in (a).

3,985,640

CRACKING WITH ZEOLITE CATALYSTS PROMOTED WITH URANIUM OR URANIUM PLUS SILVER

Roger Jean Lussier, Ellicott City, and John Storey Magee, Jr., Cooksville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 29, 1975, Ser. No. 609,318

Int. Cl.² C10G *11/04*; B01J *29/12*

U.S. Cl. 208—120 **5 Claims**

1. A method of catalytically converting hydrocarbons to produce gasoline of increased aromatic content which comprises contacting a hydrocarbon feedstock in the absence of added hydrogen at a temperature of 800° to 1000° F. with a catalyst consisting essentially of 5 to 50 percent by weight of a crystalline zeolite having a silica to alumina ratio of 2.5 to

6, dispersed in an inorganic matrix in which from 5 to 15 percent urania, silver or mixtures thereof are incorporated into the zeolite by ion exchange.

3,985,641

CATALYTIC CRACKING OF ALKANES

Jack N. Finch, and Dennis L. Ripley, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 15, 1974, Ser. No. 460,937
Int. Cl.² C10G *11/04*
U.S. Cl. 208—121 **7 Claims**

1. A method for catalytically cracking alkanes comprising contacting alkanes under cracking conditions with a catalyst consisting essentially of at least one component selected from the group consisting of unpromoted calcium oxide and an alkaline earth oxide together with a promoting amount of an additional component selected from the group consisting of chromium, molybdenum, and tungsten oxide.

3,985,642

PROCESS OF RECLAIMING LUBE OILS

John P. Friel, Lomita, and Paul L. Hammond, Richmond, both of Calif., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Apr. 28, 1975, Ser. No. 572,139
Int. Cl.² C10M *11/00*
U.S. Cl. 208—180 **10 Claims**

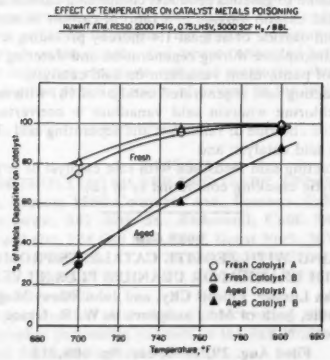
1. A process of reclaiming spent lube oil which comprises treating said spent lube oil with a composition consisting essentially of a surfactant and a polyalkylene polyamine at an elevated temperature, separating the settled impurities and recovering the reclaimed oil.

3,985,643

DEMETALATION AND DESULFURIZATION OF OIL IN SEPARATE CATALYTIC ZONES

Donald Milstein, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 393,092, Aug. 30, 1973, abandoned. This application Aug. 28, 1974, Ser. No. 501,317
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² C10G *23/00*
U.S. Cl. 208—210 **7 Claims**


EFFECT OF TEMPERATURE ON CATALYST METALS POISONING
KUWAIT ATM. RESID. 2000 PSIG, 0.75 LHSV, 5000 SCF H₂ / BBL
% of Metals Deposited on Catalyst
Temperature, °F
Fresh
Aged
Fresh Catalyst A
Fresh Catalyst B
Aged Catalyst A
Aged Catalyst B

1. In a process for hydrodesulfurizing a petroleum oil that contains residual hydrocarbon components including metals, wherein said oil and hydrogen are passed serially through two separate catalytic zones at a space velocity of about 0.1 to 5.0 L.H.S.V., a pressure of about 500 to 3,000 p.s.i.g., and with a hydrogen circulation rate of about 1,000 to 15,000 s.c.f./bbl., and at a temperature progressively increased in both catalytic zones from a start-of-run temperature of about 650°F to an end-of-run temperature of about 800°F at which temperature the active hydrodesulfurization catalyst in the second catalytic zone becomes spent, the improvement comprising taking advantage of said spent catalyst's demetalation activity by

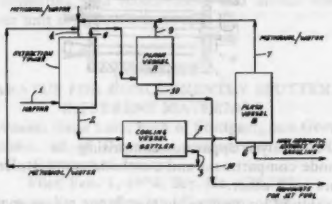
passing said oil that contains residual hydrocarbon components, and hydrogen, at a start-of-run temperature of at least about 770°F, through said first catalytic zone containing catalyst consisting essentially of said spent catalyst from said second reaction zone, thereby forming demetallized oil; and passing said demetallized oil and hydrogen, at a start-of-run temperature of about 650°F through said second reaction zone containing active hydrodesulfurization catalyst comprisisng a Group VIB and a Group VIII metal on alumina.

3,985,644

USE OF WATER/METHANOL MIXTURES AS SOLVENTS FOR AROMATICS EXTRACTION

Paul Earl Eberly, Jr., Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 30, 1975, Ser. No. 545,372
Int. Cl.² C10G *21/16*
U.S. Cl. 208—321 **10 Claims**



1. A process for the separation of aromatic and paraffinic hydrocarbon constituents of an aromatics-containing petroleum distillate selected from the group consisting of kerosene, naphtha, diesel fuel and mixtures thereof which comprises the steps of (1) introducing at a temperature of from about 150° to about 400° F. the petroleum distillate into an extraction zone containing a methanol/water solvent having at least 20 vol.% of water to obtain an aromatic-rich solvent phase and a paraffinic-rich raffinate phase, (2) passing the solvent phase to a cooling and settling zone where the temperature is lowered to below 150° F., thereby separating an aromatic-rich hydrocarbon stream and a solvent stream, (3) recycling the solvent stream to the extraction zone, and (4) recovering as products a paraffinic-rich hydrocarbon stream and an aromatic-rich hydrocarbon stream.

3,985,645

SCHEELITE FLOTATION

Harvey Leander Noblitt, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Oct. 11, 1974, Ser. No. 514,049
Claims priority, application Canada, Oct. 11, 1973, 183171
Int. Cl.³ B03B *7/00*
U.S. Cl. 209—10 **14 Claims**

8. A process for the separation of scheelite from calcite present in an ore or a concentrate formed from an ore, the process comprising the steps of:

a. decomposing any flotation agent residues contained in said concentrate;

b. feeding said ore or concentrate to a mixing vessel and admixing therein said ore or concentrate with water to form a slurry containing from 10 to 30% solids;

c. feeding said slurry to a bank of rougher flotation cells containing an alcoholic frother and a flotation agent

comprising a mono-substituted butane diamine of the formula $H_2N.C_4H_8.N(H)R$, wherein R is a long-chain saturated or partially-unsaturated aliphatic hydrocarbon radical having at least 14 carbon atoms, to provide a rougher concentrate;

d. passing said rougher concentrate through a cleaning vessel containing an aqueous cleaning medium to provide cleaner tailings and a cleaner concentrate;

e. recycling said cleaner tailings through said rougher flotation cells to said cleaning vessel;

f. passing said cleaner concentrate from said cleaning vessel to a recleaning vessel containing an aqueous cleaning medium to provide recleaner tailings and a final scheelite concentrate in the flotation froth; and

g. recycling said recleaner tailings through said cleaning vessel to said recleaning vessel and filtering and drying said final scheelite concentrate.

3,985,646

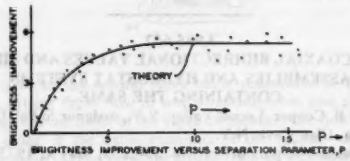
METHOD FOR MAGNETIC BENEFICIATION OF PARTICLE DISPERSIONS

Robin R. Oder, San Francisco, Calif., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 495,712, Aug. 8, 1974, abandoned. This application July 25, 1975, Ser. No. 599,299

Int. Cl.² B03C *1/00*

U.S. Cl. 209—214 **12 Claims**



1. A method for effecting magnetic separation of magnetically attractable particles for a dispersion of said particles in a fluid carrier, comprising:

passing said dispersion through a ferromagnetic filamentatious matrix within a non-magnetic canister disposed in magnetic field; said matrix forming part of a magnetic separator system characterized by the parameters Q, d, η, M, X, D, H and τ, where Q is the magnetic susceptibility and d the mean diameter of said attractable particles, η is the dispersion viscosity, M the magnetization and D the mean diameter of the filaments of said matrix, X is the fraction of said canister volume occupied by said matrix, H is the intensity of the applied magnetic field, and τ is the retention time for said dispersion in said field; and

determinatively setting one or more of the parameters D, H, τ and X for said system, in accordance with anticipated values of Q η, M and d, so as to yield a desired C_o/C ratio, where C is the number of particles entering said system and C_o is the number leaving said system; said parameters being selected in accordance with the relationship $C_o/C = e^{-\alpha P}$ where α is a numerical coefficient characteristic of the system, and p is the system separation parameter and interrelates said parameters by the expression: $p = Q/\eta(d/D)^2 M \tau H X (1-X)$.

3,985,647

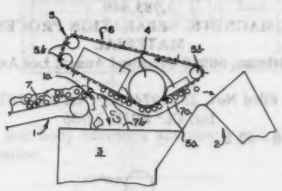
CLEATED CONVEYOR BELT

Milbourn L. Smith, Glenwood, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,846

Int. Cl.² B03C *1/20*

U.S. Cl. 209—218 **10 Claims**



1. An improved belt member for use in a magnetic separating device of the type wherein a moving conveyor is interposed between a magnetic assembly and a waste aggregate comprising a mixture of magnetic and nonmagnetic materials, and wherein the magnets attract said magnetic materials, draw it from said mixture, and hold it in sliding contact with said moving belt member, said sliding contact resulting in severe scoring and abrading of said belt member; the improvement comprising a plurality of protective tumble-inducing cleats on the outer surface of said belt member, said belt member including a plurality of regularly spaced, outwardly projecting transverse sweep bars and said cleats being regularly spaced with respect to said sweep bars, said cleats being substantially rectangular in cross-section and lying transverse said belt member, and a cleat abutting each of said sweep bars on the downstream side thereof.

3,985,648

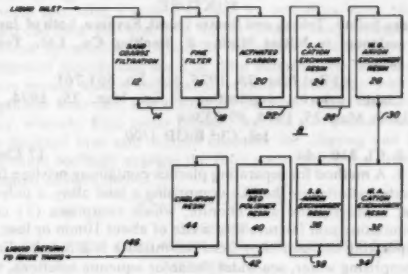
METHOD AND SYSTEM FOR PURIFYING LIQUID

Angelo J. Casolo, Columbia, Md., assignor to Almag Pollution Control Corporation, Baltimore, Md.

Filed June 27, 1974, Ser. No. 483,801

Int. Cl.² C02B *1/42, 1/56*

U.S. Cl. 210—27 **8 Claims**



1. A method of purifying mineral contaminated water including in sequence the steps of:

a. displacing said mineral contaminated water through a strong acid cation exchange resin in the hydrogen form to provide a partially contaminated water efflux having a pH value within the range of 1.0 and 5.0;

b. adjusting the pH value of said partially contaminated water containing minerals into a substantial range between 7.0 and 10.0 by passage of said partially contaminated water through a weak base anion exchange resin in the hydroxyl form;

c. exchanging hydrogen ions for mineral ions in said pH value adjusted water by passage of said water through a

weak acid cation exchange resin in the hydrogen form to form a partially contaminated acidic water having a pH value in the range 3.0–7.0; and,

d. transporting said acidic water through a strong base anion exchange resin in the hydroxyl form to provide an efflux having a pH value within the range 7.0–10.0.

3,985,649

FERROMAGNETIC SEPARATION PROCESS AND MATERIAL

Roy T. Eddelman, 60916 Terminal Annex, Los Angeles, Calif. 90054

Filed Nov. 25, 1974, Ser. No. 526,787
Int. Cl.² B01D *35/06*
U.S. Cl. 210—42 S **11 Claims**

1. A process of conveying a solid from one container to another comprising:

placing a plurality of particles of a ferromagnetic substance in a test tube;

moving a magnet near the outer surface of the first tube near the bottom end thereof;

placing a collar over the open end of the tube; and

moving the magnet upwardly along the tube to a point above the upper opening of the tube whereby the particles of a ferromagnetic substance and any substance entrapped thereby are moved into the collar.

3,985,650

METHOD FOR SEPARATING PLASTICS-CONTAINING MIXTURE

Kozo Saitoh, Tokyo, and Sumio Izumi, Sayama, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1975, Ser. No. 561,761
Claims priority, application Japan, Mar. 25, 1974, 49-33303; Mar. 25, 1974, 49-33304
Int. Cl.² B03D *1/00*
U.S. Cl. 210—44 **17 Claims**

1. A method for separating plastics-containing mixture from waste batteries or the like comprising a lead alloy, a polyolefin, a polystyrene and ebonite, which comprises (1) comminutating said mixture into a size of about 10mm or less; (2) separating the lead alloy from the mixture in a running liquid comprising water, sea water, brine or aqueous solutions, with the lead alloy being recovered as a residue; (3) placing the plastics mixture from which the lead alloy has been separated in a separation cell containing an aqueous liquid medium in the presence of a wetting agent in the amount of 10 to 500g per ton of mixture to be treated, said wetting agent being selected from the group consisting of sodium lignin sulfonate, calcium lignin sulfonate, tannic acid, a quebracho extract, gelatin, glue and saponin; (4) introducing gas bubbles into the cell thereby to cause the gas bubbles to selectively adhere to the surface of the polyolefin and float the polyolefin, with the polyolefin being recovered as a float; (5) adding a flotation agent in the amount of at least 10g per ton of mixture to be treated into the cell containing the plastics mixture from which the polyolefin has been separated, said flotation agent being selected from the group consisting of pine oil, cresylic acid, eucalyptus oil, camphor oil, a derivative of a higher alcohol, methylisobutyl carbinol, pyridine and o-toluidine; and (6) introducing gas bubbles into the cell thereby to cause the gas bubbles to selectively adhere to the surface of the polystyrene and float the polystyrene, with the polystyrene being recovered as a float and the ebonite being recovered as a residue.

3,985,651

METHOD OF TREATING WASTEWATER WITH FLOWABLE FLOCCULANTS

Jack R. Newman, Skokie, Ill., assignor to Swift and Company Limited, Chicago, Ill.

Division of Ser. No. 471,316, May 20, 1974, Pat. No. 3,941,739. This application July 11, 1975, Ser. No. 595,056
Int. Cl.² C02B *1/20*
U.S. Cl. 210—54 **1 Claim**

1. A method of flocculating solids from a wastewater with a flowable flocculant having finely ground polyacrylamides comprising the steps of: mixing from about 5 to 60 weight percent, based upon the total composition, of polyacrylamides together with from about 40 to 95 weight percent of a polyhydric alcohol carrier having an approximate molecular weight greater than 65 and less than 500 that is soluble in water and in which the polyacrylamides are insoluble to form a slurry; milling said slurry to a particle size of approximately 75 microns to prepare a flowable dispersion; metering and pumping water and the flowable dispersion; mixing together the flowable dispersion and the water to quickly dissolve the flowable dispersion and form an aqueous flocculant solution; feeding the aqueous flocculant solution into said wastewater to be treated; forming flocculant agglomerates thereby clarifying the wastewater; and separating the agglomerates from the wastewater.

3,985,652

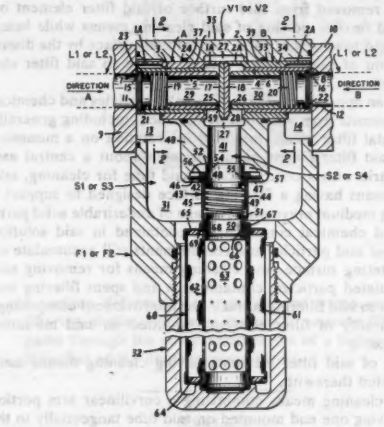
DUAL COAXIAL BIDIRECTIONAL VALVES AND FILTER ASSEMBLIES AND HYDROSTAT SYSTEMS CONTAINING THE SAME

Roydon B. Cooper, Locust Valley, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 356,231, May 1, 1973, Pat. No. 3,908,693. This application Oct. 31, 1974, Ser. No. 519,732
Int. Cl.² B01D *29/36*
U.S. Cl. 210—97 **13 Claims**

1. A filter assembly comprising, in combination, a fluid line arranged for fluid flow therethrough in either of two directions; a filter element in fluid flow connection with the fluid line, so that flow through the line in at least one direction must pass through the filter element; the filter element having a filter sheet arranged in a closed configuration about the internal passage, with end caps across the ends of the internal passage attached to the filter sheet, at least one of the end caps having an aperture therethrough in fluid flow connection with the internal passage; and a dual coaxial bidirectional flow control valve in fluid flow connection with the fluid line and the filter element and responsive to differential fluid pressure thereacross arising from flow of fluid in either direction through the line and a valve flow passage to direct flow through the filter in the same direction, comprising a tubular valve housing; first and second valves in the housing, each having first and second coaxial tubular valve elements nested concentrically and separately reciprocable within the valve housing towards and away from first and second valve seats, respectively, between closed and open positions, to close and open first and second flow passages, respectively; one of the first and second valve elements of each valve controlling flow to or from one flow passage, and the other valve element of each valve controlling flow to or from the other flow passage; bias means urging the valve elements in one direction; and a fluid-pressure-receiving surface operatively connected to each

valve element, urging the first valve element in a first direction towards or away from its valve seat, and a second valve element in a second direction towards or away from its valve seat; the biasing force of the bias means being adjusted to resist movement of each valve element in said direction away from or towards its valve seat except under differential fluid pressure arising from flow and applied to the fluid pressure receiving surface from one of the flow directions, and each of the valve elements moving in said direction towards or away from its valve seat and opening when flow begins from that flow direction and closing when flow stops from that flow direction; one of the valve elements of the first valve and one of the valve



elements of the second valve being responsive to fluid pressure arising from flow in one direction from one side of the valve, and the other of the valve elements of the first valve and the other of the valve elements of the second valve being responsive to fluid pressure arising from flow in another direction from the other side of the valve, so that the valve is arranged to open or close in response to fluid pressure arising from flow and applied from either direction of flow and to direct flow entering the valve from one fluid line from either direction to one of the first and second flow passages, and to direct flow leaving the valve via the other of the flow passages to the one fluid line for flow in either direction, and direct flow through the filter in the same direction.

3,985,653

ROTARY APPARATUS ADAPTED TO BRING AT LEAST TWO MEDIA OF DIFFERENT WEIGHT INTO ALTERNATE CONTACT WITH THE APPARATUS SURFACES

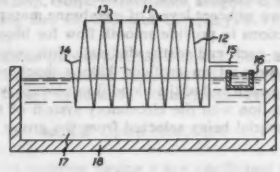
Nils Harald Ahlgren, Skyttezagen 22F, 133 00, Saltsjobaden, Sweden

Continuation of Ser. No. 188,352, Oct. 12, 1971, abandoned. This application Apr. 29, 1974, Ser. No. 465,153

Int. Cl.² B01D *21/00*

U.S. Cl. 210—150 **10 Claims**

1. An apparatus for the purification of a liquid by aeration which comprises at least one closed body having at least one ingress and one egress opening, means for containing a quantity of said liquid, means for rotating said body, said body having buoyancy of its own, whereby said closed body is supported by said liquid, said closed body floating in said liquid irrespective of the amount of said liquid within the body during rotation, contact means within the body comprising a partition adapted to drive said liquid from said ingress opening to the center of said body and to the egress opening during rotation, said liquid being forced to pass both sides of the



partition, said body admitting alternately said liquid and air during rotation.

3,985,654

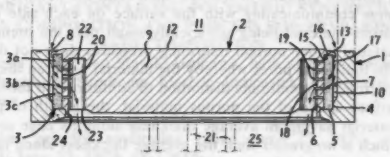
FILTER ASSEMBLY FOR FLUID POLYMERIC MATERIAL

David Boris Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Dec. 10, 1974, Ser. No. 531,406

Int. Cl.² B01D *29/06*

U.S. Cl. 210—232 **10 Claims**



1. A filter assembly for filtering viscous fluid polymeric material under pressure, said assembly comprising a sheet of filter material defining the sidewall of a first chamber therewithin, open at each end; first closure means with an opening therethrough extending across one open end of said chamber, the opening providing an outlet therefrom; means constructed and arranged around the peripheral edge of said closure means providing a sealing surface for said filter sheet end at said chamber one end, said means further being arranged to extend upwardly and outwardly therefrom to define a second chamber outside said sheet of filter material and second closure means loosely engaged in sealing relationship with the opposite filter end, and closing off the other end of said chamber; whereby fluid under pressure against said closure means is directed into said second chamber for filtering and said pressure sealingly engages the filter ends against the first and second closure means.

3,985,655

DIALYZER COIL WITH POROUS SUPPORT FOR MEMBRANE

Frederick W. Miller, III, Glenmore, Pa., assignor to Extracorporeal Medical Specialties Inc., King of Prussia, Pa.

Filed May 16, 1974, Ser. No. 470,601

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² B01D *31/00*

U.S. Cl. 210—321 A **9 Claims**

1. A dialyzer coil for use in artificial kidney machines comprising an elongated tube of membrane material, a length of porous material supporting the tube of membrane material in a generally flattened and rolled up configuration to define a first passage inside the tube of membrane material which is a relatively long, spirally directed one, linear in cross-section, and a second passage outside the tube of membrane material

which is a relatively short, axially directed one, spiral in cross-section, the length of porous material occupying one of the passages between two adjacent layers of membrane material to provide turbulent flow for dialysate, the other passage between two adjacent layers of membrane material being free of obstructions to provide smooth flow for blood, means for connecting each end of the dialysate flow passage with the dialysis system of an artificial kidney machine, means for connecting each end of the blood flow passage with tubing for communication with the circulatory system of a patient, the porous material being selected from the group consisting of

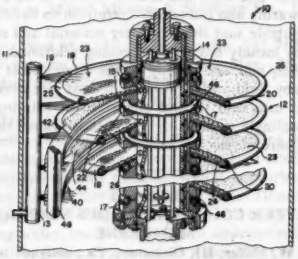
rigidized thermoplastic or thermosetting materials composed of sintered granules or foamed open cells, the majority of the pores communicating with the surface on each side of the porous material being sufficiently small that the membrane material under normal operating pressures does not distend into individual pores whereby the material between the pores controls the membrane distention to conform with the overall surface shape of the porous material, the length of porous material having an average thickness along its edge portions which is no greater than the average thickness along its mid-portion, and having an embossed configuration substantially covering one side thereof to define the blood flow passage.

3,985,656

FILTER CLEANING APPARATUS

Kostas Savas Arvanitakis, 14945 S. Dogwood Ave., Orland Park, Ill. 60462

Filed Apr. 29, 1974, Ser. No. 465,116
Int. Cl.[2] B01D *33/26*
U.S. Cl. 210—327 **3 Claims**



1. An apparatus for cleaning filter elements by removing undesirable materials such as sludge, spent filter cake and gelatinous matter from the filtering surfaces of such elements without damaging the filter element or reducing its filtering efficiency, including

curvilinear cleaning means supported across and generally parallel to a surface of a filter element having materials to be removed accumulated thereon,

said cleaning means having a relatively flexible portion to engage said surface of said filter element in an angular manner across said surface and an arm portion on which said flexible portion engaging said surface of said filter element is mounted,

said flexible portion of said cleaning means including a plurality of flexible bristles mounted on said arm portion to form a brush which may be disposed to engage said surface of said filter element, and

said arm portion extending across a portion of said surface of said filter element such that during relative movement of said filter element and said cleaning means to clean said surface of said filter element and flexible portion of said cleaning means will engage said surface of said filter element at an acute angle relative to the radials therefrom opening in the direction of movement of said filter element at the point of intercept to thereby cause said accumulated materials on said surface of said filter element to be removed from said surface of said filter element by said flexible portion of said cleaning means while being urged toward said outer edge of said surface by the disposition of said cleaning means relative to said filter element.

3. In an apparatus for removing solid particles and chemical contaminants from solutions by filtration, including generally horizontal filter means mounted for rotation on a mounting tube, said filter means being rotatable about a central axis concentric with a central axis of said tube for cleaning, said filter means having a filtering surface designed to support a filtering medium preventing passage of undesirable solid particles and chemical contaminants contained in said solution such that said particles and contaminants will accumulate on said filtering surface, and cleaning means for removing said accumulated particles, contaminants and spent filtering medium from said filtering surface, the improvement comprising

a plurality of filter elements mounted on said mounting tube,

each of said filter elements having cleaning means associated therewith,

said cleaning means comprising a curvilinear arm portion having one end mounted on said tube tangentially to the central axis of said filter elements,

a flexible portion mounted on said arm portion including a plurality of flexible bristles mounted on said arm to form a two sided brush,

said cleaning means extending across and generally parallel to said filtering surface of said filter elements in a manner such that the flexible bristles forming a brush will engage said filtering surface of said filter elements in an angular manner to assist in the removal of said particles, contaminants, and filtering medium from said surface,

said filter elements being spaced from one another by spacer means mounted on said mounting tube, and

said filter elements, said mounting tube and said spacer means being movable relative to said cleaning means such that the flexible bristles forming the two-sided brush engage an upwardly facing filtering surface of one filter element and a downwardly facing surface of an adjacent filter element, respectively, to assure complete cleaning of the filter elements and to prevent bridging of the removed material on the filtering surfaces thereof.

3,985,657

FLUID FILTER CARTRIDGE

Standly T. Coughlan, Huron, Ohio, assignor to Ford Motor Company, Dearborn, Mich.

Filed July 11, 1975, Ser. No. 595,257
Int. Cl.[2] B01D *27/02*
U.S. Cl. 210—440 **11 Claims**

1. A fluid filter cartridge having spaced inner and outer perforated walls forming concentric chambers,

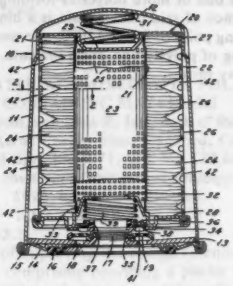
end plates capping the ends of the walls,

one of the end plates being centrally apertured to provide a passageway in communication with the inner wall chamber,

and a filtering media packing the chamber between the inner and outer walls,

wherein the improvement comprises:

a plurality of surface deformations in one of the walls extending into the filtering media toward the other wall,



the surface deformations engaging and compressing the filtering media contiguous thereto to provide filter flow paths through the compressed media of a higher density than that of the uncompressed media.

3,985,658

EXTINGUISHING AGENT FOR COMBUSTIBLE METAL FIRES

John F. Riley, Menominee, and Edgar Eugene Stauffer, Wallace, both of Mich., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 16, 1975, Ser. No. 568,764

Int. Cl.² A62D *1/00*

U.S. Cl. 252—7 **10 Claims**

1. A finely divided, fire extinguishing composition for air-combustible metal fires comprising from substantially 75 to substantially 94 weight percent of sodium carbonate, from substantially 1 to substantially 5 weight percent of a water-repellent agent, from substantially 2 to substantially 10 weight percent of a flow promoting agent, and from substantially 3 to substantially 15 weight percent of a polyamide resin as a crusting agent.

3,985,659

DRILLING FLUID COMPOSITION

Vincent F. Felicetta, and Donald E. Wenzel, both of Bellingham, Wash., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Feb. 24, 1975, Ser. No. 552,722

Int. Cl.² C09K *7/02*

U.S. Cl. 252—8.5 A **11 Claims**

1. An aqueous, low-solids drilling fluid composition comprising water, bentonite or subbentonite clay and a water-soluble graft copolymer of lignosulfonate and a polyacrylate in a sufficient amount to increase the yield of the clay, said copolymer being prepared by polymerization of the acrylate monomer with the lignosulfonate in a weight ratio of 2:1 to 1:5 of the acrylate monomer to lignosulfonate using a free radical initiator and said copolymer having a molecular weight of at least 100,000.

3,985,660

MATERIAL DISPLAYING A LOW COEFFICIENT OF FRICTION AND LOW WEAR AT HIGH LOAD AND SPEED

Herman Lankamp, Odijk, Netherlands, assignor to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Continuation-in-part of Ser. No. 503,432, Sept. 5, 1974, abandoned. This application Sept. 2, 1975, Ser. No. 609,597

Claims priority, application Netherlands, Sept. 7, 1973, 7312330

Int. Cl.² C10M *5/00*, *7/00*

U.S. Cl. 252—12 **8 Claims**

1. A bearing material having a low coefficient of friction and low wear at relatively high load, relatively high speed and relatively high temperature, comprising from 50 to 90 percent by weight of a powdered inorganic solid lubricant bonded by a polymerized mixture of unsaturated organic compounds containing at least 30% divinylbenzene and the remainder selected from the group consisting of styrene butadiene, and vinyl acetate.

3,985,661

LUBRICANT-CONTAINING POLYMERIC SYNTHETIC RESIN COMPOSITION AND PROCESS FOR PREPARING SAID COMPOSITION

Hirosaka Ikeda, and Masaki Ishikawa, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed June 27, 1974, Ser. No. 483,505

Claims priority, application Japan, June 27, 1973, 48-72653; June 27, 1973, 48-72655

Int. Cl.² C10M *5/00*, *7/00*; F16D *69/00*

U.S. Cl. 252—12 **25 Claims**

1. A lubricant-containing synthetic resin composition prepared by pre-mixing 2 to 40% by volume of a lubricant consisting of at least one lubricant oil, oiliness-increasing agent or a mixture thereof with at least one carrier which is an organic or inorganic powder having a melting point or a melting viscosity higher than the molding temperature of a base thermoplastic synthetic resin, a specific surface areas of at least 0.3 m^2/g and a limited amount of oil absorbed of at least 0.2 cc per 1 cc of said carrier, and then mixing the resulting mixture with the base synthetic resin, or mixing said lubricant, carrier and base synthetic resin simultaneously in a kneader having multiaxial mixing means and then molding the resulting mixture, the amount of said lubricant added, expressed as the ratio of the volume of said lubricant to the volume of said carrier, being not more than 10.0 times the limited amount of oil absorbed by said carrier.

3,985,662

HIGH DROPPING POINT GREASES COMPRISING A LITHIUM SOAP OF AN EPOXY-SUBSTITUTED AND/OR AN ETHYLENICALLY UNSATURATED FATTY ACID

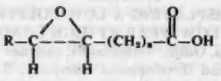
Ian D. Campbell, Sarnia; Terrance O. Brown, Corunna, both of Canada, and Donald W. Murray, Mont-Saint-Aignan, France, assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 28, 1975, Ser. No. 554,210

Int. Cl.² C10M *1/24*, *3/18*, *5/14*, *7/20*

U.S. Cl. 252—41 **17 Claims**

1. A grease composition comprising a lubricating base oil stock, a lithium soap derived from an epoxy-substituted fatty acid, characterized by the structural formula:



wherein:

R may be H or a straight or branched chain hydrocarbon radical containing from 1 to about 27 carbon atoms and n is a whole number ranging from 0 to 27, with the proviso that the total number of carbon atoms in both R and $(CH_2)_n$ is from about 5 to about 27; and a dilithium soap derived from an aliphatic dicarboxylic acid having from about 4 to about 12 carbon atoms therein, the mole ratio of lithium soap derived from a fatty acid to dilithium soap being between about 1:1 to about 5:1.

3,985,663

CONDUCTIVE INKS CONTAINING QUATERNARY AMMONIUM COMPOUNDS

Chin H. Lu, Webster, and Richard A. Parent, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 14, 1974, Ser. No. 451,315

Int. Cl.² G03G 9/12

U.S. Cl. 252—62.1 L **17 Claims**

1. A conductive ink comprising a coloring agent, a liquid carrier and a quaternary ammonium compound soluble in said carrier, said quaternary ammonium compound having the formula:

in which at least one R is a hydrocarbon having from about 1 to about 18 carbon atoms and each other R is a hydrogen or a hydrocarbon having from 1 to about 18 carbon atoms and A is an anion.

3,985,664

TONER COMPOSITION FOR USE IN ELECTROPHOTOGRAPHY COMPRISING NOVEL POLYESTER BINDER RESIN

Kahei Sakaguchi, and Hirotaka Takemoto, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1974, Ser. No. 536,903

Claims priority, application Japan, Dec. 29, 1973, 49-3687

Int. Cl.² G03G 9/08, 9/12, 9/10

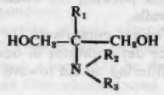
U.S. Cl. 252—62.1 R **10 Claims**

1. A toner composition capable of being charged with a positive electric charge and adapted for use in electrophotographic development, consisting essentially of finely divided particles containing from 1 to 20 parts by weight of a colorant and 80 to 99 parts by weight of binder resin, said binder resin consists essentially of

a. from 55 to 100 percent by weight of a polyester resin having a softening point of 80° to 130°C. and a nitrogen content of from 0.3 to 1.5 percent by weight, based on the total weight of said polyester resin, said polyester being obtained by reacting

1. a dicarboxylic acid component consisting essentially of from 50 to 100 mol percent of a substance selected from the group consisting of fumaric acid, maleic acid, succinic acid and anhydrides thereof, the balance of said dicarboxylic acid component being one or more polyester-forming dicarboxylic acids, or anhydrides thereof, with

2. a polyol component consisting essentially of from 10 to 100 mol percent of a glycol having the formula



wherein R_1, R_2 and R_3, which can be the same or different, are hydrogen or unsubstituted alkyl having one to 4 carbon atoms, and the balance of said polyol component is one or more polyester-forming polyols, and

b. the balance of said binder resin is a binder resin having a softening point of 80° to 150°C. selected from the group consisting of polystyrene, rosin maleate, petroleum resin and epoxy resin.

3,985,665

TONER COMPOSITION FOR USE IN ELECTROPHOTOGRAPHY COMPRISING NOVEL POLYESTER BINDER RESIN

Kahei Sakaguchi; Masaaki Minakata; Hirotaka Takemoto, all of Wakayama, and Shigeru Takamori, Osaka, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1974, Ser. No. 536,905

Claims priority, application Japan, Dec. 29, 1973, 48-3686

Int. Cl.² G03G 9/08, 9/10, 9/12

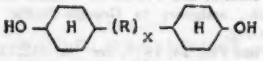
U.S. Cl. 252—62.1 R **11 Claims**

1. A toner composition capable of being charged with a negative electric charge and adapted for use in electrophotographic development, consisting essentially of finely divided particles containing from 1 to 20 parts by weight of a colorant and 80 to 99 parts by weight of binder resin, said binder resin consists essentially of

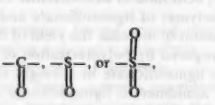
a. from 55 to 100 percent by weight of a polyester resin having a softening point of 100° to 145° C, said polyester resin being obtained by reacting

1. a dicarboxylic acid component consisting essentially of from 50 to 100 mol percent of a substance selected from the group consisting of fumaric acid, maleic acid, succinic acid and anhydrides thereof, the balance of said dicarboxylic acid component being one or more polyester-forming dicarboxylic acids, or anhydrides thereof, with

2. a polyol component consisting essentially of from 10 to 100 mol percent of a glycol having the formula



wherein x is zero or 1, R is unsubstituted alkylene having one to 5 carbon atoms, sulfur, oxygen,



and

is cyclohexyl, and the balance of said polyol component is one or more polyester-forming polyols, and

b. the balance of said binder resin is a binder resin having a softening point of 80° to 150° C selected from the group consisting of polystyrene, rosin maleate, petroleum resin and epoxy resin.

3,985,666
PLASTIC MATERIALS MIXED WITH POLAR GROUP CONTAINING MATERIALS

Roger N. Ciccarelli, and Dale R. Ims, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 13, 1971, Ser. No. 133,652

The portion of the term of this patent subsequent to July 1, 1992, has been disclaimed.

Int. Cl.² H01B *3/00, 3/18*

U.S. Cl. 252—63.2 **4 Claims**

1. A method of improving the charge retention ability of a plastic material comprising providing a plastic selected from the group consisting of styrenes, methacrylic acid, m-(m-phenoxy phenoxy) phenol, styrene-vinyltoluene copolymers, cyanuric acid derivatives and mixtures thereof incorporating in said plastic a compound having polar groups said compound being selected from the group consisting of butyllithium, carboxylic acids, alkali metal carboxylates, lithium salts, sodium salts, copper salts, tin salts, carbon chlorine compounds and mixtures thereof and applying a charge to the surface of said material; with the proviso that the plastic and polar groups concentration is defined such that;

a. when said plastic material is composed of identifiable monomeric units the polar group is present in an amount of about 1 polar group to about 1,000 monomeric units to about 1 polar group per 5 monomeric units;

b. when said plastic material is not comprised of identifiable monomeric units the range of polar group concentration may be expressed in terms of mole percent so that addition of about 0.1 percent to about 20 mole percent of polar group defines the above range;

c. when said plastic material is made from ethylenically unsaturated monomers the range of polar groups may be expressed as about 1 polar group per 2,000 backbone carbon atoms to about 1 polar group per 10 backbone carbon atoms.

3,985,667
PROCESS AND COMPOSITION FOR DRILLING SHALE FORMATION IN SEA WATER

Kenneth Russell Gray; Lloyd Eugene Van Blaricom, and Harvey Rudolph Deweyert, all of Shelton, Wash., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 10, 1973, Ser. No. 405,155

Int. Cl.² C09K *7/02*

U.S. Cl. 252—8.5 A **2 Claims**

1. A process for drilling a well through shale formation in sea water comprising

drilling through said shale while circulating in the well an aqueous drilling mud comprising a clay-sea water slurry containing an iron complex of a mixture of a potassium salt of lignosulfonate and from 5–15% by weight of hydroxy acid salts, said mixture being prepared by reacting sodium or ammonium base spent sulfite liquor including reducing sugars and from 5 to 25%, based on the solids content of the spent sulfite liquor, of potassium hydroxide, said reaction being carried out at a temperature of from 50° to 175° C to produce a reaction product having a final pH no less than 10, said iron complex being prepared by adding a ferric salt to said reaction product whereby from ½ to 4% of the final product, based on total solids, of a ferric complex of said hydroxy acid salts is formed.

3,985,668
SCOURING COMPOSITIONS

William Law Hartman, Cheviot, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 9, 1974, Ser. No. 504,218

Claims priority, application United Kingdom, Apr. 17, 1974, 16814/74

Int. Cl.² C11D *7/54*

U.S. Cl. 252—99 **11 Claims**

1. An aqueous false-body hard-surface scouring composition having reduced tendency to form a liquid layer above said false-body compositions, said composition consisting essentially of:

A. a continuous false-body fluid phase formed by admixing an aqueous liquid with an organic or inorganic colloid-forming agent capable of forming said liquid phase into a false-body fluid, such that the concentration of aqueous liquid ranges from about 30% to 90% by weight of the total composition and the concentration of the colloid-forming agent ranges from about 1% to 10% by weight of the total composition;

B. relatively heavy, water-insoluble particulate abrasive material having particle diameters ranging from one micron to about 250 microns and a specific gravity equal to or greater than that of the continuous false body phase, said relatively heavy abrasive material being suspended throughout said continuous false-body fluid phase to the extent that the total concentration of relatively heavy abrasive material ranges from 2% to about 60% by weight of the total composition; and

C. relatively light, water-insoluble particulate filler material having particle diameters ranging from one micron to about 250 microns and a specific gravity less that that of the continuous false body phase, said relatively light particulate material being suspended throughout said continuous false body fluid phase to the extent that the concentration of relatively light particulate material ranges from about 1% to 15% by weight of the total composition;

wherein the ratio of the average particle diameters of the relatively heavy abrasive material and the relatively light filler material ranges from 0.25:1 to 2.1:1.

3,985,669
DETERGENT COMPOSITIONS

H. Karl Krummel, and Terrell W. Gault, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed June 17, 1974, Ser. No. 479,951

Int. Cl.² C11D *9/18*

U.S. Cl. 252—116 **19 Claims**

1. A spray-dried granular detergent composition capable of rapidly reducing the free polyvalent metal ion content of an aqueous solution, comprising:

a. from about 5% to about 92% by weight of a water-insoluble aluminosilicate ion exchange material of the formula

$$Na_z[(AlO_2)_z.(SiO_2)_y]x\ H_2O$$

wherein z and y are integers of at least 6; the molar ratio of z to y is in the range from 1.0 to about 0.5, and x is an integer from about 15 to about 264; said aluminosilicate ion exchange material having a particle size diameter from about 0.1 micron to about 100 microns; a calcium ion exchange capacity of at least about 200 mg. eq. $CaCO_3$/g.; and a calcium ion exchange rate expressed as $CaCO_3$ of at least about 2 grains/gallon/minute/gram;

b. from about 5% to about 92% by weight of a water-soluble organic surface-active agent selected from the group consisting of anionic, nonionic, ampholytic and zwitterionic surface-active agents and mixtures thereof; and

c. from about 0.5% to 3% by weight of an alkali metal silicate solid having a molar ratio of SiO_2 to alkali metal oxide in the range from about 0.5 to about 4.0.

3,985,670
LIQUID REGULATED-FOAM DETERGENT COMPOSITIONS

Markus Berg, Dusseldorf-Holthausen; Jürgen Hoffmeister, Dusseldorf-Benrath; Günter Jakobi, Hilden Rhineland, and Peter Krings, Krefeld, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed May 21, 1974, Ser. No. 471,860

Claims priority, application Germany, June 1, 1973, 2327857

Int. Cl.² C11D *9/30, 15/04*

U.S. Cl. 252—117 **2 Claims**

1. A liquid phosphate-free, regulated foam washing agent composition consisting essentially of:

a. from 15% to 60% by weight of a mixture of low and high ethoxylated ethylene oxide adducts to fatty alcohols having from 12 to 20 carbon atoms, with degrees of ethoxylation of 2 to 6 and 8 to 20 where the ratio of the 2 to 6 ethoxylated compound to the 8 to 20 ethoxylated compound in the mixture is from 1:5 to 2:1,

b. from 0.2% to 8.0% by weight of foam inhibitors selected from the group consisting of non-surface-active foam inhibitors in an amount of from 0.2% to 0.8% by weight, alkali metal salts of saturated fatty acids having a chain length distribution in the range of 12 to 22 carbon atoms in an amount of from 1.5% to 8.0% by weight and mixtures of non-surface-active foam inhibitors and soaps in the aforesaid amounts,

c. from 0.3% to 15% by weight of at least one water-soluble salt of an organic compound capable of sequestering calcium, said organic compound being selected from the group consisting of aminoalkane polycarboxylic acids, alkane polyphosphonic acids, carboxymethyl derivatives of alkanepolyols having 2 to 6 carbon atoms and hydroxyalkane-carboxylic acids having 3 to 6 carbon atoms, said carboxymethyl derivatives having at least 2 carboxyl groups, polymeric carboxylic acid compounds with a molecular weight of over 350 and at least one carboxyl group per each molecular weight unit of 175, phosphonoalkane polycarboxylic acids, aminoalkanepolyphosphonic acids and hydroxyalkanepolyphosphonic acids,

d. from 10% to 40% by weight of a water-soluble or water-emulsifiable organic solvent having no more than 7 carbon atoms selected from the group consisting of alkanols and alkanediols having from 1 to 5 carbon atoms, esters thereof with alkanoic acids having no more than 4 carbon atoms and ethers thereof with hydroxyalkanols having no more than 4 carbon atoms,

e. from 0 to 10% by weight of at least one of the following: optical brighteners, soil suspension agents, wash alkalis, antimicrobial compounds, hydrotropic compounds and opacifiers, and

f. the balance, up to 100% by weight, of water, with the proviso that a 1% aqueous solution of the said liquid washing agent composition has a pH of 8.5 to 10.

3,985,671
SCALE CONTROL AGENTS

Herbert D. Clark, Burbank, Calif., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Sept. 26, 1974, Ser. No. 509,506

Int. Cl.² C02B *5/04, 5/06*

U.S. Cl. 252—180 **6 Claims**

1. The synergistic mixture of from about 90% to about 30% by weight of a polyaminoalkylenephosphonate in which the alkylene group is methylene, ethylene or propylene and from about 10% to about 70% by weight of poly[oxyethylene(dimethyliminio)ethylene(dimethyliminio)ethylenedichloride].

3,985,672
POLYBUTENE COMPOSITION CONTAINING BROMINATED DIALKYLHYDANTOIN ADDITIVE AND USE THEREOF

John A. Cengel, Wheaton, and Imre Puskas, Glen Ellyn, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 402,487, Oct. 1, 1973, Pat. No. 3,927,041. This application May 19, 1975, Ser. No. 578,639

Int. Cl.² C09K *3/00;* C08L *1/00;* C08K *5/00;* C07D *307/60*

U.S. Cl. 252—182 **3 Claims**

1. A butene polymer composition comprising butene polymer having a $\overline{M}_n$ in the range of 300–3000 and having an additive concentration of 5–200 ppm of 1,3-dibromo-5,5-dialkyl-substituted hydantoin based on said butene polymer, wherein the alkyl-substituents have a total of 2 to 21 carbon atoms.

3,985,673
STABILIZATION OF MIXTURES OF MERCAPTOALKYLNITRILES AND THIODIALKYLNITRILES

Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 16, 1975, Ser. No. 623,122

Int. Cl.² C09K *15/32;* C08K *5/36*

U.S. Cl. 252—182 **16 Claims**

1. A method for stabilizing a mixture of

A. a mercaptoalkylnitrile of the formula

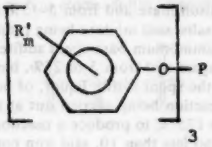
$$HS - (CR_2)_n - CN$$

wherein each R is individually selected from the group consisting of hydrogen and alkyl groups having from 1 to 5 carbon atoms, the maximum number of carbon atoms in all the R groups being 10, and n is an integer having a value of 1 to 5, and

B. the corresponding thiodialkylnitrile of the formula

$$NC - (CR_2)_n - S - (CR_2)_n - CN$$

wherein R and *n* are as defined above, the maximum number of carbon atoms in all the R groups being 20, the weight ratio of said compound (A) to said compound (B) being in the range of 99:1 to 1:99, which consists of incorporating with said mixture a stabilizing amount of an organic phosphite of the formula



3

wherein R′ is individually selected from the group consisting of hydrogen and alkyl groups having from 1 to 20 carbon atoms, and m is an integer having a value of 1 or 2.

3,985,674

STABILIZED SODIUM DITHIONITE SOLUTIONS

Leonard C. Ellis, Chesapeake, and Mearl A. Kise, Portsmouth, both of Va., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Filed Dec. 10, 1974, Ser. No. 531,290
Int. Cl.² C01B *17/66*; D21C *9/10*
U.S. Cl. 252—188 **15 Claims**

1. A storage-stabilized aqueous sodium dithionite bleaching solution, comprising:

A. A chelating agent which is selected from the group consisting of ethylenediaminetetraacetic acid tetrasodium salt and nitrilotriacetic acid trisodium salt, said nitrilotriacetic acid trisodium salt being at a concentration in said solution of 0.3–1.0% by weight;

B. a source of zinc ion which is selected from the group consisting of zinc sulfate and zinc dithionite at a concentration in said solution of 0.1–0.5% by weight;

C. a complex former which comprises sodium tripolyphosphate at a concentration of 0.6–3.0% by weight;

D. a source of hydroxyl ion which comprises sodium carbonate at a concentration in said solution of 1.0–4.0% by weight; and

E. sodium dithionite at a concentration by weight of at least 12%, said sodium dithionite being zinc derived.

3,985,675

PROCESS FOR GELLING AQUEOUS POLYOL SUSPENSIONS AND RESULTING GEL

Keun Young Kim, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 110,605, Jan. 28, 1971, Pat. No. 3,875,289. This application Feb. 13, 1975, Ser. No. 549,649
Int. Cl.² B01J *13/00*
U.S. Cl. 252—317 **6 Claims**

1. A process for gelling an aqueous suspension of a polyol, selected from the group consisting of sorbitol, mannitol and glycerine, which comprises adding thereto a calcium sodium pyrophosphate having the formula $CaNa_2P_2O_7.xH_2O$, where x has a value of from about 0.1 to about 2 in a sufficient amount to bring about gellation whereby a gel is formed having gel strength of about 500 dyne/cm² to about 100,00 dyne/cm².

5. A gel which comprises (1) a polyol, selected from the group consisting of sorbitol, mannitol and glycerine, said polyol being present in an amount of at least about 15 weight percent, based on the total weight of the gel, (2) amorphous calcium disodium pyrophosphate having the formula $CaNa_2P_2O_7.xH_2O$, wherein x has a value of from about 0.1 to about 2.0, said pyrophosphate being present in an amount of at least 0.05 weight percent, based on the total weight of the gel, and (3) water, said water constituting the balance; said gel having a gel strength of about 100 dyne/cm² to about 100,000 dyne/cm².

3,985,676

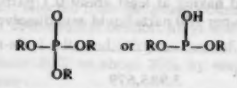
CATALYST COMPOSITION AND METHOD FOR THE PREPARATION THEREOF

Louis J. Rekers, Wyoming, and Stanley J. Katzen, Cincinnati, both of Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 436,263, Jan. 24, 1974, abandoned. This application Dec. 16, 1974, Ser. No. 532,131
Int. Cl.² C08F *4/78*
U.S. Cl. 252—428 **16 Claims**

1. A process for the preparation of an olefin polymerization catalyst, comprising

a. reacting chromium trioxide with an organophosphorus compound having the formula:



wherein R is alkyl, aralkyl, aryl, cycloalkyl, or hydrogen, but at least one R group is other than hydrogen;

b. depositing the resultant organophosphoryl chromium reaction product upon a solid inorganic support material; and

c. heating said support material and said organophosphoryl chromium product in a dry oxygen containing atmosphere at a temperature above about 400° F and below the temperature at which the structure of the support is impaired, for a period of time sufficient to promote the activity of the catalyst.

3,985,677

PREPARATION OF POLYMERIZATION CATALYST AND POLYMERIZATION THEREWITH

Morford C. Throckmorton, Akron, and Paul H. Sandstrom, Tallemadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 301,397, Oct. 27, 1972, Pat. No. 3,845,029. This application June 24, 1974, Ser. No. 482,119
Int. Cl.² C08F *4/14*
U.S. Cl. 252—429 B **2 Claims**

1. In a composition suitable for use as a catalyst comprising (1) at least one organoaluminum compound, (2) at least one organonickel compound selected from the group consisting of nickel salts of carboxylic acids, organic complex compounds of nickel, and nickel tetracarbonyl, and (3) at least one fluorine compound selected from the group consisting of hydrogen fluoride, boron trifluoride, complexes of hydrogen fluoride and complexes of boron trifluoride, said complexes prepared by complexing hydrogen fluoride and/or boron trifluoride with a member of the class consisting of ketones, esters, ethers, alcohols, nitriles and water, the improvement comprising preforming said catalyst by mixing the catalyst components in the presence of a polymeric catalyst stabilizer selected from the group consisting of polymers derived from the homopolymerization of hydrocarbon conjugated diolefins, the copolymerization of hydrocarbon conjugated diolefins and the copolymerization of hydrocarbon conjugated diolefins with styrene or methyl substituted styrene, said catalyst being prepared or preformed in such a manner that said polymeric catalyst stabilizer is added to the mixture before the reaction between the organoaluminum compound and the organonickel compound, in which the mole ratio of the organoaluminum compound/organonickel compound ranges from about 0.3/1 to about 200/1, the mole ratio of the fluoride compound/organoaluminum compound ranges from about 0.2/1 to about 10/1 and the weight ratio of the polymeric catalyst stabilizer to the nickel in the organonickel compound ranges from about 2/1 to about 2000/1.

3,985,678

ISOPARAFFIN ALKYLATION

John H. Estes, Wappingers Falls, and Edward L. Cole, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 484,095, June 28, 1974, abandoned, which is a division of Ser. No. 343,322, March 21, 1973, Pat. No. 3,867,475. This application Mar. 14, 1975, Ser. No. 558,391
Int. Cl.² B01J *27/02*
U.S. Cl. 252—429 R **9 Claims**

1. A catalyst for use in an alkylation process wherein an isoparaffin hydrocarbon is alkylated with an olefin-acting alkylating agent; which catalyst consists essentially of about 98.5 to about 88 weight percent of a liquid acid selected from sulfuric, fluorosulfonic, and mixtures thereof, about 0.5 to about 8 weight percent acid oils, about 0 to about 6 weight

percent water, and having at least about 0.1 parts by weight carbon dioxide gas per 100 parts liquid acid dissolved therein.

3,985,679

TRANSITION METAL CATALYST SUPPORTED ON PARTICULATE HIGH SURFACE AREA BBB TYPE POLYMER

Paul D. Taylor, Clinton; Anthony B. Conciatori, Chatham, and Rufus S. Jones, Jr., Randolph, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,047

Int. Cl.² B01J *31/06, 31/28*

U.S. Cl. 252—430 **13 Claims**

1. A process for the formation of an improved supported transition metal catalyst comprising:

a. contacting a particulate polymer possessing benzimidazo-nitrogen groups which is a condensation product of at least one organic tetra-amine with at least one tetra-carboxylic acid or the corresponding anhydride and having a surface area of about 100 to 500 square meters per gram with a solution of a salt of a transition metal wherein the benzimidazo-nitrogen groups present upon the surface of said polymer form a coordination complex with said salt,

b. recovering said particulate polymer bearing said coordination complex upon the surface thereof, and

c. reducing the transition metal cations of said coordination complex present upon the surface of said polymer to the metallic form.

3,985,680

OXIDATION CATALYST

George C. Allen, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 176,298, Aug. 30, 1971, abandoned, which is a division of Ser. No. 796,651, Feb. 3, 1969, Pat. No. 3,644,509. This application Oct. 16, 1975, Ser. No. 623,155

Int. Cl.² B01J *29/16, 23/34;* C07C *51/24*

U.S. Cl. 252—456 **6 Claims**

1. A catalyst composition comprising the empirical formula

$$Mo_aV_bW_cMn_dO_e$$

wherein the atomic ratio of Mo:V:W:Mn:O is such that when *a* is 12, *b* is from 0.5 to 12, *c* is from 0.1 to 6.0, *d* is from 0.5 to 20 and *e* is from 37 to 94.

3. The catalyst composition of claim 1 on a silica support.

3,985,681

CATALYST FOR THE OXIDATION OF AMMONIA

Michel Senes, LaBaule; Michel Pottier, and Jean-Francois Courdier, both of Saint Nazaire, all of France, assignors to Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques, Paris, France

Continuation-in-part of Ser. No. 316,541, Dec. 19, 1972, abandoned. This application Aug. 16, 1974, Ser. No. 498,228

Claims priority, application France, June 15, 1972, 72.21544

Int. Cl.² B01J *23/10, 23/78, 23/82, 23/84*

U.S. Cl. 252—462 **14 Claims**

1. A catalyst composition suitable for use in the catalytic oxidation of ammonia to oxides of nitrogen, comprising:

80–99.5% by weight of Co_3O_4 is substantially a spinel $(Co^{IV}Co^{II}_2)O_4$ structure;

0.5–20% by weight of at least one of the oxides of the group of metals consisting of the rare earths and thorium; and

0.5–19.5% by weight of at least one further oxide selected from the group consisting of the oxides of manganese, iron, mangesium, chromium and niobium,

said catalytic composition having a specific surface ranging from 12 to 100 m^2/g.

3,985,682

METHOD OF PREPARING SOLID CONTACT MATERIALS

Neville L. Cull, Baker; Lloyd A. Pine, Baton Rouge, both of La., and Dale D. Maness, Austin, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Sept. 25, 1972, Ser. No. 291,908

Int. Cl.² B01J *23/08*

U.S. Cl. 252—463 **9 Claims**

1. A process for preparing a porous solid contact material which comprises the steps of:

a. immersing a porous solid inorganic hydrophilic carrier material in a polar organic presoak liquid such that said presoak liquid substantially completely fills the pores of the carrier material, said presoak liquid being capable of (1) wetting said carrier material and (2) displacement by the impregnating solution used in step (b) at a rate slow enough to permit control of the depth of impregnation;

b. separating the carrier material from the presoak liquid and, without substantial removal of presoak liquid from the pores of said carrier material, immersing the separated carrier material in an impregnating solution containing a compound which is decomposable into a desired active material for a time sufficient to permit the impregnating solution to displace a portion of the presoak liquid and thereby penetrate the carrier material to a controlled depth, the depth of penetration being controlled by the time during which said separated carrier material is immersed in said impregnating solution at any given set of impregnating conditions; and

c. separating the impregnated carrier material from the impregnating solution, drying the carrier material and converting the decomposable compound to the desired active material, thereby yielding a contact material having a core of substantially unimpregnated carrier surrounded by an outer zone of carrier having said active material deposited thereon.

3,985,683

CATALYST FOR REDUCING THE TOXIC CONTAMINANTS OF COMBUSTION ENGINE EXHAUST GAS

Jürgen Stenzel, Erftstadt Liblar, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 525,181, Nov. 19, 1974, abandoned. This application Mar. 6, 1975, Ser. No. 555,879

Claims priority, application Germany, Nov. 24, 1973, 2358664

Int. Cl.² B01J *21/04, 23/84*

U.S. Cl. 252—466 J **9 Claims**

1. A process for making a catalyst reducing the toxic contaminants of combustion engine exhaust gases, which comprises: heating the honey comb carrier to temperatures within the range 300° and 400° C; introducing the hot carrier into a concentrated solution of an aluminum salt of a volatile acid for a period within the range 15 and 60 minutes; expelling excess liquid from the honey comb carrier and drying it at room temperature; heating the dry carrier for a period within the range 1 and 4 hours to temperatures within the range 350° and 450° C and then calcining it for a period within the range 2 and 6 hours at temperatures within the range 500° and 700° C with the resultant formation of an intermediary layer of aluminum oxide on the honey comb carrier; heating the carrier to temperatures within the range 300° and 400° C; dipping the hot carrier in a hot concentrated aqueous solution of catalytically active copper, nickel and manganese salts of volatile acids and allowing it to remain therein for a period within the range 15 and 60 minutes; expelling excess liquid from the honey comb carrier and drying it for a period within the range 1 and 4 hours at temperatures within the range 350° and 450° C; and calcining it for a period within the range 5 and 20 hours at temperatures within the range 700° and 1000° C.

3,985,684

HEAVY CRUDE CONVERSION

William F. Arey, Jr.; Glen P. Hamner, and Willard H. Sawyer, all of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 440,301, Feb. 7, 1974, abandoned. This application Dec. 16, 1974, Ser. No. 533,331

Int. Cl.[2] B01J *23/84, 23/16, 23/64, 23/62*

U.S. Cl. 252—469 16 Claims

1. A catalyst having enhanced selectivity suitable for the conversion and demetallization of feeds which contain large quantities of 1050° F.+ hydrocarbon materials comprising an admixture of from about 0.1 to about 10 percent of a Group IVA metal, from about 5 to about 30 percent of a Group VIB metal, and from about 1 to about 12 percent of a Group VIII metal, measured as oxides, and a porous inorganic oxide support, said catalyst, when the catalyst is of size ranging from 1/500 to about 1/50 inch average particle size diameter, having at least about 20 percent of its total pore volume of absolute diameter within the range of about 100A to about 200A; when the catalyst is of size ranging from about 1/50 inch up to 1/25 inch average particle size diameter, at least about 15 percent of its total pore volume of absolute diameter within the range of about 150A to about 250A; when the catalyst is of size ranging from about 1/25 inch to about 1/8 inch average particle size diameter, at least about 15 percent of its total pore volume of absolute diameter within the range of about 175A to about 275A, a surface area ranging at least about 200 m^2/g to about 600 m^2/g and a pore volume ranging from about 0.8 cc/g to about 3.0 cc/g.

3,985,685

PYROELECTRIC MATERIALS AND DEVICES

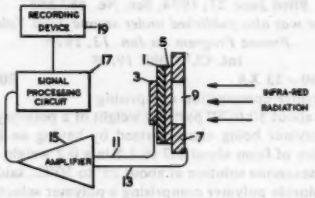
Michael Richard Houlton; Gordon Robert Jones, and Norman Shaw, all of Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 22, 1975, Ser. No. 624,692

Claims priority, application United Kingdom, Oct. 26, 1974, 46400/74

Int. Cl.[2] H01B *1/06*

U.S. Cl. 252—521 5 Claims



1. A pyroelectric material consisting of lead germanate doped with barium and having a compositional formula $Pb_{3-x}Ba_xGe_3O_{11}$, wherein x is in the range $0<x \leq 0.5$.

3,985,686

DETERGENT COMPOSITIONS CONTAINING ENZYMES

Christian Barrat, Brussels, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 30, 1972, Ser. No. 310,740

Int. Cl. C11d *3/26, 1/38*

U.S. Cl. 252—547 4 Claims

1. A detergent composition consisting essentially of:

a. from 0.001% to about 5% by weight of a proteolytic enzyme having an iso-electric point greater than 9.5 selected from the group consisting of the enzymes produced by bacillus alcalophilus NCIB8772 and bacterium strain NCIB 10147;

b. from about 20% to about 80% by weight of a cationic surfactant selected from the group consisting of monoammonium di-long-alkyl di-short alkyl and mono-long-alkyl tri-short-alkyl salts and mixtures thereof; and

c. from about 80% to about 20% by weight of an anionic surfactant;

wherein said surfactants (b) and (c) are expressed by reference to the sum of both.

3,985,687

LIQUID DETERGENT COMPOSITIONS OF CONTROLLED VISCOSITIES

Jack T. Inamorato, Westfield, and William Chirash, New Providence, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 26, 1974, Ser. No. 536,655

Int. Cl.[2] C11D *1/14, 1/22, 1/831*

U.S. Cl. 252—551 21 Claims

1. A liquid detergent comprising from 10 to 40% of a nonionic synthetic organic detergent which is a polyethoxylated higher alkanol wherein the alkanol is of 10 to 18 carbon atoms and which contains from 3 to 12 ethylene oxide groups per mol, and 3 to 15% of a water soluble synthetic organic anionic detergent selected from the group consisting of polyethoxy higher alkanol sulfates wherein the alkanol is of 10 to 18 carbon atoms and wherein from 2 to 8 ethylene oxide groups are present per mol and higher linear alkyl benzene sulfonates wherein the higher alkyl is of 10 to 15 carbon atoms, and mixtures thereof, 4 to 10% of a lower alkanol of 2 to 3 carbon atoms or a mixture of such alkanols, 2 to 12% of a mixture of sodium chloride and sodium nitrate, wherein the proportion of sodium chloride to sodium nitrate is in the range of 1:3 to 3:1 and about 13 to 81% of water, which is of a viscosity in the range of 40 to 120 centipoises at 24° C. and which is fluid at 7° C.

3,985,688

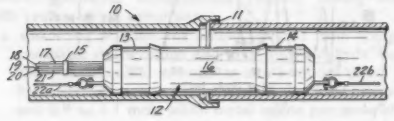
POLY (URETHANE-UREA) FOAM SEALANTS FOR UNDERGROUND APPLICATION AND FLUID PRECURSORS

Steven R. Speech, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 254,527, May 18, 1972, Pat. No. 3,894,131. This application Jan. 28, 1974, Ser. No. 437,061

Int. Cl.[2] C08G *18/14, 18/32*; E02D *3/14*

U.S. Cl. 260—2.5 AP 9 Claims



1. A water-miscible fluid composition comprising a water-miscible mixture, having an average molecular weight of about 1000–1300, in a compatible water-miscible solvent of a water-miscible isocyanate-terminated polyoxyalkylene urethane prepolymer component having a molecular weight of 1250 to 1550 and a water-miscible isocyanate-terminated polyoxyalkylene urethane prepolymer component having a molecular weight of 850 to 1000, said prepolymer components having a plurality of oxyethylene units sufficient to render the same water-miscible and being reactable with water to form a foamed poly(urethane-urea).

3,985,689

SORBENT FOAM MATERIAL

Alan N. Ferguson, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 20, 1974, Ser. No. 471,579

Claims priority, application United Kingdom, May 25, 1973, 25182/73

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.[2] C08G *69/46, 73/06*

U.S. Cl. 260—2.5 R 16 Claims

1. A black sorbent thermoset foam which has been prepared by the pyrolysis of a composition, liquid at the pyrolysis temperature, comprising at least one Lewis acid metallic salt and at least one aromatic nitrogen-containing compound having the general formula:

X — Ar — Y

in which Ar represents an aromatic nucleus to the wherein X represents a substituent having a negative Hammett sigma constant and attached by a nitrogen, oxygen or sulphur atom, and Y represents a substituent having a positive Hammett sigma constant and attached by a nitrogen atoms, the substituents X and/or Y forming part of a ring fused onto the aromatic nucleus or are attached to the aromatic nucleus, the thermoset foam having a specific surface area of at least 50 m^2/g, and said pyrolysis comprising heating said composition to a temperature below 300°C to initiate reaction of said composition.

3,985,690

ENZYME SEPARATION

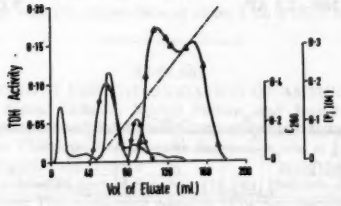
Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, Fairlight, 238 Windsor Road, Maidenhead, Berkshire, both of England

Continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned. This application May 13, 1974, Ser. No. 469,221

Claims priority, application United Kingdom, Feb. 11, 1971, 4469/71

Int. Cl.[2] C08L *89/00*

U.S. Cl. 260—6 8 Claims



1. A reactive matrix consisting essentially of a co-enzyme chemically attached to a water-insoluble organic polymeric support material in which the co-enzyme is nicotinamide adenine dinucleotide, said reactive matrix being free from chemically attached enzymes, said water-insoluble organic polymeric support material containing said co-enzyme chemically attached thereto being capable of attracting enzymes in affinity chromatography which are attracted to said coenzyme, thereby making it possible to separate enzymes from other components of a liquid medium containing said enzymes as well as other enzymes.

3,985,691

PARTICULATE NITROCELLULOSE COMPOSITION

Francois De Taffin, and Jacques Plazanet, both of Bergerac, France, assignors to Societe Nationale des Poudres et Explosifs, France

Division of Ser. No. 360,770, May 16, 1973, abandoned. This application Aug. 12, 1974, Ser. No. 496,694

Claims priority, application France, May 17, 1972, 72.17682

Int. Cl.[2] C08L *75/06, 1/18*

U.S. Cl. 260—13 3 Claims

1. A polyurethane lacquer comprising a polyurethane and a particulate nitrocellulose composition which consists essentially of nitrocellulose and from 10 to 30% by weight, based on the weight of nitrocellulose, of a hydroxylic plasticizer containing at least one free hydroxyl group, said plasticizer being a lower alkyl ester of lactic acid, tartaric acid or citric acid.

3,985,692

CONTROL OF OVERSPRAY IN SOLVENT SYSTEM PAINTS

Robert C. Sykes, Winnetka, and Joseph F. Vartiak, Naperville, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 5, 1974, Ser. No. 529,901

Int. Cl.[2] C09D *3/26, 3/36, 3/66*

U.S. Cl. 260—22 CB 10 Claims

1. A sprayable oil based paint containing an oil soluble hydrocarbon polymer formed by the polymerization of at least one hydrophobic hydrocarbon monomer through an aliphatic hydrocarbon unsaturated group and having a molecular weight of at least 50,000, the quantity of said polymer being sufficient to reduce overspray when said paint is sprayed but insufficient to substantially increase the viscosity of said paint and constituting 0.0015% to 0.01% by weight of said paint.

3,985,693

POLYVINYL CHLORIDE POLYBLEND MOLDING COMPOSITION

Thor J. G. Lonning, Suffield, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed June 27, 1974, Ser. No. 483,865

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.[2] C08F *19/08*

U.S. Cl. 260—23 XA 20 Claims

1. A polymer composition comprising:

A. from about 50 to 80 parts by weight of a polyvinyl chloride polymer being characterized by having an inherent viscosity of from about 0.7 to 1.5 in a 0.2 weight percent cyclohexanone solution at about 25° to 30°C., said polyvinyl chloride polymer comprising a polymer selected from the group consisting of homopolyvinyl chloride and polyvinyl chloride copolymers having up to 25 weight percent of another ethylenically unsaturated comonomer polymerizable therewith,

B. a butadiene-styrene rubbery substrate having a butadiene content of 68 to 95 percent by weight and a styrene content of 5 to 32 percent by weight based on the total weight of the butadiene-styrene rubbery substrate which rubbery substrate is further characterized as having a particle size in the range of from 0.06 to 0.2 micron, a gel content in the range of from 40 to 95 percent, a swelling index in the range of from 10 to 40, and a second order transition temperature (Tg) less than −40°C.,

C. A superstrate grafted onto the rubber substrate which superstrate comprises:

1. the polymerization product of a first polymerizable monomer composition comprising:

a. from 0.1 to 2 percent by weight of a nonconjugated diolefin monomer,

b. from 20 to 30 percent by weight of an ethylenically unsaturated nitrile selected from the group consisting of acrylonitrile, and mixtures of acrylonitrile and methacrylonitrile which contain up to 20 percent by weight of methacrylonitrile,

c. from 40 to 60 percent by weight of a vinylidene aromatic hydrocarbon monomer selected from the group consisting of styrene and alpha methyl styrene,

d. from 20 to 50 percent by weight of methyl methacrylate, and

2. the polymerization product of a second polymerizable monomer composition comprising from 55 to 85 percent by weight of an ethylenically unsaturated nitrile monomer selected from the group consisting of acrylonitrile and mixtures of acrylonitrile and methacrylonitrile which contains up to 20 percent by weight of methacrylonitrile based on the total weight of acrylonitrile and methacrylonitrile and from 15 to 45 percent by weight of a monovinylidene aromatic hydrocarbon monomer wherein the percent by weight is based on the total weight of the monomers in the second polymerizable monomer mixture;

wherein the grafted superstrate contains a total of at least 40 percent by weight ethylenically unsaturated nitrile monomer and wherein the ratio of grafted superstrate to substrate is in the range of from 15–200:100 wherein (B) plus (C) are present in from about 20 to 50 parts by weight, the total parts by weight of (A), (B) and (C) being 100 parts,

D. a plasticizer system for said polymer composition, said plasticizer system being present in a sufficient amount to produce in said polymer composition after such is heat fused at a temperature of from about 120° to 215°C., a Shore A hardness value in the range of from about 45 to 95 at about 23°C.,

E. a stabilizer system for said polymeric composition, said stabilizer system being present in such amounts as to substantially prevent the thermal degradation of said polymeric composition during heat fusion for 5 to 15 minutes at temperatures in the range of from about 120° to 215°C., and

F. a lubricant system present in such amounts as to permit the release of said polymeric composition from a heated solid surface after said polymeric composition has been heat fused at temperatures in the range of from about 120° to 215°C.

3,985,694

ASPHALTIC COMPOSITIONS CONTAINING SYNTHETIC TERPENIC RESIN AND AN INTERPOLYMER OF ETHYLENE, VINYL ACETATE AND AN ORGANIC ACID

Richard J. Petrucco, Laurel Springs, and Charles A. Pagen, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 29, 1974, Ser. No. 501,540

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C08L 91/00

U.S. Cl. 260—28.5 AS **8 Claims**

1. An asphaltic composition comprising a major amount of asphalt, a minor amount of a synthetic terpenic resin, and a minor amount of an interpolymer of ethylene, vinyl acetate, and an organic acid selected from the group consisting of acrylic, methacrylic, itaconic, maleic and fumaric acids; the alkyl hydrogen maleates and the alkyl hydrogen fumarates.

3,985,695

WATER REDUCIBLE EPOXY ESTER COATING COMPOSITION

Michael A. Tobias, Somerville, N.J., and Richard A. Lamanna, Jefferson Borough, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,997

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C08G 51/24

U.S. Cl. 260—29.2 EP **11 Claims**

1. An epoxy ester comprising an ester adduct of a polyfunctional epoxy resin containing more than one 1,2-epoxy group and a monofunctional 1,2-epoxy with a saturated dibasic acid the ratio of said polyfunctional epoxy resin to said monofunctional epoxy being 3–5 based upon epoxide equivalent weight, the ratio of equivalents of said dibasic acid to total epoxide being 1.0–1.2 and trimellitic anhydride, the ratio of anhydride equivalents in said trimellitic anhydride to total epoxide being 0.1–0.3; the reaction between said epoxy resin, said monofunctional epoxy, and said dibasic acid being carried out in a solvent at elevated temperature until the alcoholic acid number is 3–22 and the epoxy content is 0.025–0.035 meq./g to obtain an initial ester and reacting said initial ester with trimellitic anhydride at a lower elevated temperature until the alcoholic acid number and the aqueous acid number are substantially equal.

3,985,696

PROCESS OF PREPARING AQUEOUS SOLUTIONS OF MELAMINE-FORMALDEHYDE CONDENSATION PRODUCTS HAVING ANIONIC SULFO GROUPS

Alois Aignesberger, Trostberg; Paul Bornmann, Stein an der Traun; Hans-Gunter Rosenbauer, and Hans Theissig, both of Trostberg, all of Germany, assignors to Suddeutsche Kalkstickstoff-Werke AG, Trostberg, Germany

Filed Nov. 14, 1974, Ser. No. 523,555

Claims priority, application Germany, Nov. 28, 1973, 2359291

Int. Cl.² C08L 61/20

U.S. Cl. 260—29.4 R **7 Claims**

1. A process of preparing an aqueous solution of a melamine-formaldehyde condensation product having anionic sulfo groups which comprises:

a. dissolving at least one amine selected from the group consisting of melamine and urea, formaldehyde, and an alkali metal sulfite in water in a ratio of 0.9 to 1.1 mole formaldehyde per amino group of said at least one amine, and 0.9 to 1.1 mole alkali metal sulfite per mole of said amine, not more than 40 mole percent of said amine being urea;

b. holding the temperature of the resulting aqueous solution at 60° to 80° C while maintaining in said solution a pH of 10 to 13 until said solution is free from sulfite;

c. adding enough of a mineral acid to said sulfite-free solution to adjust the latter to a pH of 3.0 to 4.5;

d. holding the temperature of the adjusted solution at 30° to 60° C for 30 to 90 minutes;

e. thereafter adding enough of an alkaline material to said solution to increase the pH thereof to 7.5 to 9.9; and

f. holding the temperature of the solution of increased pH at 70° to 95° C until the viscosity of a sample diluted to 20% solids by weight is between 5 and 40 centipoises at 20° C.

3,985,697

HYDROPHILIC CONTACT LENS MATERIAL

Jacques Urbach, North Hollywood, Calif., assignor to Uroptics International Incorporated, Los Angeles, Calif.

Continuation-in-part of Ser. No. 298,511, Oct. 18, 1972, abandoned. This application May 20, 1974, Ser. No. 471,575

Int. Cl.[2] C08L *29/02*; C08F *216/04*

U.S. Cl. 260—29.6 TA 13 Claims

1. As a material for the formation of hydrophilic articles, the composition consisting of:

a. a major amount of hydroxy alkyl acrylate or methacrylate,

b. between 0.01 and 0.25% by weight of said composition of a non-water-soluble alkyl diester of acrylic acid or methacrylic acid and having no free hydrophilic groups, and

c. between 0.5% and about 10% by weight of said composition of a low molecular weight acid having an unsaturated double bond and selected from the group consisting of acrylic acid, methacrylic acid, vinyl acetic acid, crotonic acid and isocrotonic acid.

6. A rigid hydrophilic terpolymer consisting of the composition of:

a. a major amount of a hydroxy alkyl acrylate or methacrylate,

b. between 0.01 and 0.25% by weight of said composition of a non-water-soluble alkyl diester of acrylic acid or methacrylic acid and having no free hydrophilic groups, and

c. between 0.5% and about 10% by weight of said composition of a low molecular weight acid having an unsaturated double bond and selected from the group consisting of acrylic acid, methacrylic acid, vinyl acetic acid, crotonic acid and isocrotonic acid,

said composition being polymerized with a free radical organic peroxide polymerization catalyst.

10. A process for forming a soft contact lens, comprising:

providing a non-aqueous mixture of a major amount of hydroxy alkyl acrylate or methacrylate, between 0.01 and 0.25% by weight of said mixture of an alkyl diester of acrylic acid or methacrylic acid, said diester having no free hydrophilic groups, and between 0.5% and about 10% by weight of said mixture of a low molecular weight acid having an unsaturated double bond, said acid being selected from the group consisting of acrylic acid, methacrylic acid, vinyl acetic acid, crotonic acid and isocrotonic acid,

polymerizing said mixture with a catalyst to form a sparingly cross-linked, rigid, non-hydrated, hydrophilic terpolymer,

mechanically forming an optical contact lens from said rigid hydrophilic terpolymer, and

hydrating said lens subsequent to mechanical formation.

11. A contact lens formed by the process of claim 10, and wherein greater than about 2% of said low molecular weight acid is included in said mixture so that the resultant terpolymer has a water concentration of greater than about 57% by weight upon hydration.

3,985,698

METHOD FOR IMPROVING EMULSION PAINT BY ADDING AN ACRYLIC RESIN PRODUCED FROM A TERTIARY AMINE CONTAINING ETHYLENICALLY UNSATURATED MONOMER

Tadashi Matsudaira; Tadashi Watanabe; Yashuhiko Haruta, and Teiitsu Takagi, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

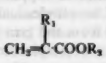
Filed Feb. 24, 1975, Ser. No. 552,201

Claims priority, application Japan, Feb. 26, 1974, 49-21900

Int. Cl.[2] C08L *33/00*

U.S. Cl. 260—29.6 TA 9 Claims

1. A method for improving emulsion paint which is characterized in that 1 to 40 parts by weight as solids of aqueous amine, ammonia or inorganic base solubilized acrylic resin solution is added to 100 parts by weight as resin solid of emulsion paint, said aqueous acrylic resin solution being produced from 1 to 20% by weight of at least one tertiary amine containing ethylenically unsaturated monomer selected from the group consisting of N,N-dimethylaminoethylacrylate, N,N-dimethylaminoethylmethacrylate, N,N-diethylaminoethylacrylate and N,N-diethylaminoethylmethacrylate; 5 to 20% by weight of ethylenically unsaturated monomer having at least one carboxyl group; and 60 to 94% weight of another ethylenically unsaturated monomer which is at least one member of the group of acrylic or methacrylic ester of the formula:



in which R_1 is hydrogen or methyl and R_2 is alkyl of 1 to 11 carbon atoms, hydroxyethylmethacrylate, hydroxyethylacrylate, hydroxypropylmethacrylate, hydroxypropylacrylate, acrylamide, N-methylolacrylamide, N-methylolmethacrylamide, N-methylolacrylamide butyl ether and styrene.

3,985,699

METHOD OF MANUFACTURING MOULD MEMBERS OF POLYURETHANE-BONDED GRANULAR MATERIAL

Herman Pius Schmid, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed June 2, 1975, Ser. No. 583,321

Claims priority, application Sweden, June 7, 1974, 7407505

Int. Cl.[2] C08K *3/35*

U.S. Cl. 260—31.2 N 13 Claims

1. A method for manufacturing mould members which comprises:

A. mixing together:

1. a granular material;

2. 0.5 to 1.5% by weight based on the weight of said granular material of a polyurethane forming cold-hardenable bonding agent composition of polyisocyanate and a polyhydroxy member selected from the group consisting of aliphatic polyether, aromatic polyether, phenol derivative and mixtures thereof; and

3. 0.5 to 3% by weight based upon the weight of said granular material of a solvent for dissolving said bonding agent composition, wherein said solvent has an evaporation rate which corresponds to a reference value of 100–800 when the normal butyl acetate has a reference value of 100 and pure acetone has a reference value of 1,000;

B. shaping mixture obtained from step (A) above into a predetermined form; and

C. blowing gaseous triethylamine through the shaped mixture from step (B) to thereby catalyze the formation of the polyurethane forming bonding agent.

3,985,700

PROCESS FOR THE PRODUCTION OF A DISPERSION OF CONDENSATION POLYMER PARTICLES CONTAINING A MODIFYING AGENT

Peter Francis Nicks, Maidenhead; Peter George Osborn, Bourne End; Morice William Thompson, Maidenhead, and Patricia Lesley James, Kingswinsford, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 13, 1974, Ser. No. 479,175

Claims priority, application United Kingdom, June 18, 1973, 28838/73

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.[2] C08J *3/02*, *3/20*; C08K *5/01*, *5/02*

U.S. Cl. 260—33.6 R 12 Claims

1. A process for the production of a dispersion of condensation polymer particles in a hydrocarbon or chlorinated hydrocarbon liquid medium in which the polymer is insoluble,

wherein the disperse particles of polymer are of a size from 0.1 μ to 100 μ and incorporate at least one modifying agent for the polymer, the process comprising heating in the said liquid medium at polymerisation temperature an appropriate condensation polymer-forming reactant or reactants, the reactant or at least one of the reactants being present as a liquid disperse phase in an emulsion of which the continuous phase is constituted by the said liquid medium and which is produced with the aid of from 1 to 10 percent by weight, based on the disperse phase, of an emulsifying agent which is a polymeric material containing in its molecule at least one chain-like component of a type which is soluble and non-self-associated in the liquid of the disperse phase and at least one chain-like component of another type which is soluble and non-self-associated in the liquid of the continuous phase, the average molecular weight of the individual components being at least 1,000, the total molecular weight of the individual components of each type being at least 3,000 or at least $n \times 1{,}000$ where n is the number of the individual components of the other type, and the ratio of the total weights of the individual components of the two types being from 3:1 to 1:3, in addition one of the chain-like components of the emulsifying agent which is soluble in a disperse phase being also capable of associating with the polymer produced, dispersing in the said liquid phase of the emulsion prior to completion of the polymer-forming condensation reaction the modifying agent or agents and then completing the polymer-forming reaction.

3,985,701

RUBBER CONTAINING ACID-TREATED OILS AND ITS PREPARATION

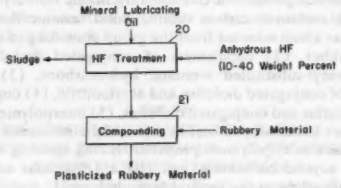
Abraham Schneider, Philadelphia, and Archibald P. Stuart, Media, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 547,670, May 4, 1966, which is a continuation of Ser. No. 186,825, April 6, 1962, abandoned, which is a continuation of Ser. No. 822,155, June 22, 1959, abandoned, which is a continuation-in-part of Ser. No. 409,478, Feb. 10, 1954, abandoned. This application May 29, 1967, Ser. No. 657,438

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² C08K *5/01*; **C10G** *17/02*

U.S. Cl. 260—33.6 AQ **2 Claims**



1. Process for preparing rubber compositions which comprises admixing a rubber selected from the group consisting of natural rubber, homopolymers of conjugated diolefins, and copolymers of conjugated diolefins with ethylenically unsaturated monomers, with mineral oil having at least 10 Wt. % aromatic compounds which has been obtained by

a. mixing a mineral oil starting material with an acidic reagent comprising anhydrous hydrogen fluoride in amount from 10 to 40 percent by weight of said starting material; thereby to form an acid phase insoluble in said mineral oil and containing components extracted from said starting material, and an oil phase comprising unextracted components of said starting material and containing dissolved acidic material,

b. separating said phase from said oil phase,

c. mixing said oil phase with an alkaline reagent to neutralize said dissolved acidic material and form neutralization products, and

d. separating said neutralization products from said oil phase.

3,985,702

DRY BLENDING AND MOLDING PROCESS

Glenn Roy Himes, Torrance, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed May 27, 1975, Ser. No. 581,197

Int. Cl.² C08K *5/01*

U.S. Cl. 260—33.6 AQ **9 Claims**

1. The process for making a molded article having a thermoplastic elastomer component and a thermoplastic polymer component selected from the group consisting of polystyrene, ethylene vinyl acetate copolymer, polyethylene, polypropylene and mixtures thereof, comprising:

a. forming small particles of thermoplastic rubber;

b. forming particles of thermoplastic polymer having an average particle size diameter less than about 1.0 mm;

c. dry blending the particles from steps a) and b) together with a liquid plasticizer for at least the rubber or the polymer to produce a free-flowing particulate mixture;

d. and forming the mixture into a molded article.

3,985,703

PROCESS FOR MANUFACTURE OF ACRYLIC CORE/SHELL POLYMERS

William J. Ferry, Fairless Hills, Pa.; Donald H. Jones, Vincentown, and Roger K. Graham, Moorestown, both of N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed June 24, 1975, Ser. No. 589,972

Int. Cl.² C08J *3/20*; **C08K** *3/04*, *3/26*, *3/36*

U.S. Cl. 260—42.29 **8 Claims**

1. A process for producing an acrylic core/shell polymer having 55 to 85 parts of an acrylic rubbery core comprising polymerizing 15 to 45 parts of a hard shell polymer onto a pre-formed rubbery core polymer under emulsion conditions and spray-drying the resultant latex in a spray dryer while blowing 0.01 to 1.5 parts inert particulate material into the gaseous drying media of the spray dryer.

3,985,704

METHACRYLATE-BUTADIENE-STYRENE GRAFT POLYMERS AND PROCESS FOR THEIR PRODUCTION

Donald H. Jones, Vincentown, N.J., and William J. Ferry, Fairless Hills, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed June 19, 1975, Ser. No. 588,544

Int. Cl.² C08J *3/20*; **C08K** *3/04*, *3/26*, *3/36*

U.S. Cl. 260—42.32 **8 Claims**

1. A process for producing a multiple stage, sequentially produced, impact modifier having a high butadiene content comprising graft polymerizing methyl methacrylate and styrene in any order onto a polymerized butadiene or butadiene-styrene polymer so as to form a latex of a two or more stage polymer, spray drying the resultant graft polymer latex while blowing 0.01 to 5% by weight inert particulate material into the gaseous spray drying medium in the spray dryer, the rubber content of the resultant graft polymer being at least about 70% by weight.

3,985,705

STABILIZED POLYESTER COMPOSITIONS

Paul C. Georgoudis, Dunellen, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 348,217, April 5, 1973, Pat. No. 3,888,817. This application Feb. 5, 1975, Ser. No. 547,172

Int. Cl.² C08K 5/00

U.S. Cl. 260—45.8 A 4 Claims

1. A saturated polyester composition stabilized against thermal degradation comprising:
   a. a polyester blended with
   b. 0.3 to 5.0 percent, by weight of the polyester, of a combination comprising
      1. 10 to 90 percent, by weight, of at least one cyclic organic carbonate having at least one cyclic organic carbonate group per molecule containing 5 - 6 atoms in the ring, and
      2. the remainder of said combination comprising at least one antioxidant selected from the group consisting of alkylated phenols and alkylidene bisphenols wherein the alkyl groups contain from 2 to 18 carbon atoms, thiobisphenols and polyphenols.

3,985,706

SMOKE-RETARDANT FOR CHLORINATED POLYETHYLENE AND VINYL CHLORIDE POLYMERS

Edward L. Kay, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 24, 1975, Ser. No. 561,387

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² C08J 3/20

U.S. Cl. 260—45.75 W 5 Claims

1. A polymer composition of the class consisting of chlorinated polyethylene and polyvinyl chloride which polymer has a chlorine content of 10 to 75 per cent and is compounded with 1 to 25 parts of zinc borate ($2ZnO.3B_2O_3.3.5\ H_2O$) and 6 to 150 parts of $Al_2O_3.3H_2O$ which act synergistically as a smoke suppressant when the polymer composition is burned.

3,985,707

PROPYLENE OXIDE COPOLYMER COMPOSITION

Robert L. Shell, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 344,311, March 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 179,176, Sept. 9, 1971, abandoned. This application June 23, 1975, Ser. No. 589,171

Int. Cl.² C08K 5/39; C08G 23/06

U.S. Cl. 260—45.75 N 8 Claims

1. A heat age resisting composition comprising (A) 100 parts by weight of a rubbery sulfur-cured copolymer of propylene oxide containing from about 70 to about 97 percent units derived from propylene oxide and correspondingly from about 30 to about 3 percent units derived from monomers selected from allyl glycidyl ether and unsaturated monoepoxides containing 4 to about 10 carbon atoms in admixture with (B) about 1 to about 20 parts by weight of a synergistic mixture of a nickel dialkyl dithiocarbamate and an imidazole selected from 2-mercaptobenzimidazole and its metal salt where the ratio of the carbamate units to imidazole units is in the range of from about 25/1 to about 1/12, where the alkyl radical of the carbamate is a saturated alkyl radical containing 1 to 8 carbon atoms and where the rubbery copolymer has a molecular weight of at least about 500,000.

3,985,708

POLYMERIC REACTION PRODUCTS OF THIODIETHANOL AND DIPHENOLS

Eugene Yue Chieh Chang, Somerset County, and Robert Saxon, Mercer County, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 18, 1974, Ser. No. 507,025

Int. Cl.² C08G 75/02, 75/12

U.S. Cl. 260—47 R 12 Claims

1. A vulcanizable elastomer composition comprising a copolymer represented by the formula:

$$H\text{-}\{OG\}_x\text{-}OH$$

wherein $\{OG\}$ comprises randomly distributed structural units of (I) and (II) taken alone or optionally with (III)

$$\{OC_2H_4SC_2H_4\} \quad (I)$$

$$\{OR\} \quad (II)$$

$$\{OR'\} \quad (III)$$

wherein R represents the residue remaining on removal of two phenolic hydroxyl groups from a dihydric phenolic compound and R′ represents the residue remaining on removal of two hydroxyl groups from an aliphatic diol; said copolymer characterized in that the ratio of structural units (I) to structural units (II), or optionally, to the total of structural units (II) and (III), is not less than 1:1, and further characterized in that up to about 10 mole percent, based on total number of structural units [OG] of structural units (III), in said copolymer, contain external unsaturation having an allylic hydrogen atom; and x is an integer sufficient to provide a molecular weight of at least about 8000.

3,985,709

POLYMERIC COMPOSITIONS

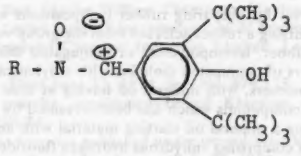
William M. Saltman, and Melvin Auerbach, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 438,117, Jan. 30, 1974, Pat. No. 3,903,049. This application May 12, 1975, Ser. No. 576,814

Int. Cl.² C08L 7/00

U.S. Cl. 260—47 UA 2 Claims

1. An oxidation resistant polymeric composition comprising the reaction product of (A) a sulfur-curable rubbery polymer having carbon-to-carbon double bond unsaturation in the polymer chain selected from the group consisting of (1) natural rubber, (2) copolymers of conjugated diolefins and monovinyl-substituted aromatic hydrocarbons, (3) copolymers of conjugated diolefins and acrylonitrile, (4) copolymers of α-olefins and conjugated diolefins, (5) interpolymers of one or more lower alkyl α-olefins and a diene monomer, and (6) polymers or copolymers prepared by ring opening of one or more acyclic monomers, and (B) a 1,3-dipolar compound corresponding to the general formula



wherein R is selected from a group consisting of (1) alkyl radicals containing from 1 to 12 carbon atoms, (2) naphthyl radicals, (3) cycloalkyl radicals, (4) phenyl radicals, and (5) substituted phenyl radicals containing at least one substituent selected from the group consisting of chlorine, bromine, io-

dine and fluorine atoms and alkyl, alkoxy, nitro, tertiary amino, cyano, carboxy and carboalkoxy radicals.

3,985,710

ANTIOXIDANTS

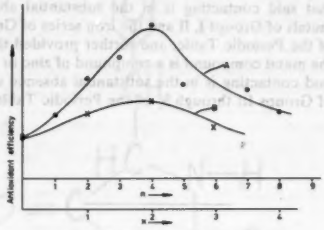
Gerald William Langsley, Baslow, via Bakewell, England, assignor to Coalite and Chemical Products Limited, Chesterfield, England

Filed Nov. 8, 1974, Ser. No. 522,147

Claims priority, application United Kingdom, Nov. 9, 1973, 52160/73; Aug. 7, 1974, 10305/74

Int. Cl.² C08G 75/04

U.S. Cl. 260—48 **28 Claims**



1. A resin which is the condensation product of (1) a mercaptoaldehyde and (2) a member of the group consisting of hydroxybenzene and mononuclear, monohydric phenols containing a halogen or a C_1–C_8 aliphatic hydrocarbyl group as a substituent in a position ortho or para to the phenolic hydroxyl group and being unsubstituted in a position ortho or para to the phenolic hydroxyl group, said mercaptoaldehyde having the formula $R—S—CH(R_1)—CH_2—CHO$ in which R_1 is hydrogen or a C_1–C_4 alkyl group and R is a C_1– C_{17} alkyl group, and the molar ratio of said member to said mercaptoaldehyde being from 0.5:1 to 8:1.

3,985,711

DICARBOXYLIC COMPOUNDS HAVING 2,4-QUINAZOLINEDIONE RINGS AND POLYESTER RESINS DERIVED THEREFROM

Choua Cohen, Grenoble; Bruno Durif-Varambon, Eybens; Robert Salle, and Bernard Sillion, both of Grenoble, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf, Rueil-Malmaison, France

Division of Ser. No. 288,478, Sept. 13, 1972, Pat. No. 3,882,121. This application Mar. 5, 1975, Ser. No. 555,431

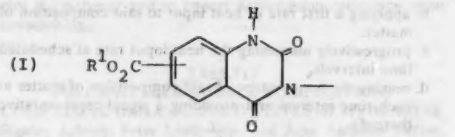
Claims priority, application France, Sept. 15, 1971, 71.33327; Apr. 10, 1972, 72.12565

Int. Cl.² C08G 63/18

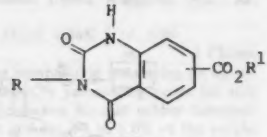
U.S. Cl. 260—75 N **19 Claims**

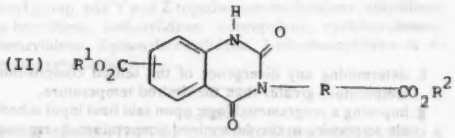
1. A polyester resin which is the reaction product resulting from condensation of a polycarboxylic component with a polyhydroxyl component, in which said polycarboxylic component comprises, expressed as carboxylic equivalents,

from 10 to 100% of at least one dicarboxylic heterocyclic compound of the formula



or





in which R is an aromatic radical of 5–20 carbon atoms, R^1 is a hydrogen atom or an alkyl or cycloalkyl radical of 1–10 carbon atoms and R^2 is an alkyl or cycloalkyl radical of 1–10 carbon atoms,

from 0 to 90% of at least one polycarboxylic aromatic compound, and

from 0 to 10% of at least one aliphatic dicarboxylic compound; and in which said polyhydroxyl component comprises, expressed as hydroxyl equivalents,

from 50 to 100% of at least one polyol containing at least three hydroxyl functions, and

from 0 to 50% of at least one aliphatic or cycloaliphatic diol; said polycarboxylic component and polyhydroxyl component being involved in such proportions that the ratio of the sum of the hydroxyl functions to the sum of the carboxylic functions is greater than 1.

3,985,712

METHOD AND APPARATUS FOR PREPARING INTERMEDIATE POLYESTER RESIN

John M. Garst, Blacklick, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 12, 1975, Ser. No. 549,216

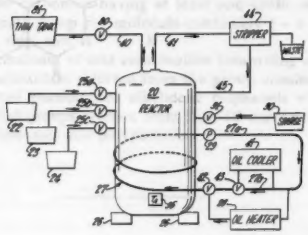
Int. Cl.² G05B 21/00; C08G 63/12

U.S. Cl. 260—75 M **3 Claims**

1. A programmable method for raising the temperature of a composition of matter which characteristically generates exothermic heat comprising:

a. providing a time synchronized reference signal corresponding to a desired temperature vs. time variation pattern,

b. applying a first rate of heat input to said composition of matter,
c. progressively increasing the heat input rate at scheduled time intervals,
d. sensing the temperature of said composition of matter at each time interval and providing a signal representative thereof,
e. comparing said signal with the time synchronized reference signal corresponding to the scheduled time interval.



f. determining any divergence of the sensed composition temperature greater than the desired temperature,
g. imposing a programmed logic upon said heat input schedule responsive to the determined temperature divergence until the sensed composition temperature converges with the desired temperature,
h. repeating steps c through g until the desired elevated temperature is attained.

3,985,713

CYCLIC NITRILES AS CROSSLINKING AGENTS AND COMPOSITIONS THEREFROM

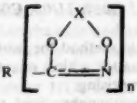
Kurt C. Frisch, Grosse Ile; Sidney L. Reegen, Oak Park, and Harry L. Bauer, Detroit, all of Mich., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 139,951, May 3, 1971, abandoned. This application Nov. 15, 1972, Ser. No. 306,668
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl. C08g *22/00*
U.S. Cl. 260—77.5 CR **8 Claims**

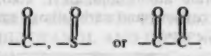
1. A thermally cross-linkable coating composition comprising

A. an acrylic interpolymer having an hydroxyl number of 40 to 80 and an acid number of 5 to 15 comprised of:
1. an alkyl ester of acrylic or methacrylic acid,
2. acrylic or methacrylic acid,
3. styrene, and
4. hydroxy propyl or hydroxy ethyl methacrylate

B. a cyclic nitrile having the structure:



wherein R is an organic radical free of nucleophilic groups and having from 2 to about 200,000 carbons atoms, X is:



and *n* ranges from 2 to about 100,000,

C. a catalyst selected from:
I. a tertiary amine or
II
a. a compound of first metal or a mixture of metals selected from the metals of Groups III through V of the Periodic Table, which is soluble in the reaction mixture, and
b. a compound of second metal or a mixture of metals selected from the metals of Groups I and II and the iron series of Group VIII of the Periodic Table, which is soluble in the reaction mixture or
III. a compound of aluminum, tin, titanium, zinc, bismuth or iron which is soluble in the reaction mixture, provided that the metal is in a valence state other than zero, further provided that when the metal compound is a compound of aluminum, tin, titanium or bismuth that said contacting is in the substantial absence of metals of Groups I, II and the iron series of Group VIII of the Periodic Table, and further provided that when the metal compound is a compound of zinc or iron that said contacting is in the substantial absence of metals of Groups III through V of the Periodic Table.

3,985,714

POLYAMIDATION PROCESS BY MAINTAINING TEMPERATURE AND PRESSURE DIFFERENTIAL CONTROLS

David Roy Kidder, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 324,504, Jan. 17, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,666
Int. Cl.² **C08G** *69/28*
U.S. Cl. 260—78 R **5 Claims**

1. In a continuous process for preparing a filament from a polyamide having an imbalance of acid and amine ends, as well as a relative constant product of said ends, by heating at a constant throughput an aqueous solution of a salt comprised of nonequivalent proportions of diamine and dicarboxylic acid in an evaporator apparatus at a temperature of 105°–180° C. to concentrate it, passing the concentrated solution to a reactor where it is polymerized at amidation temperature and pressure, passing the molten polyamide produced to a finisher vessel where it is further polymerized, pumping the molten polyamide from the finisher vessel through a transfer line to a spinning machine, and spinning the finished polyamide into a continuous filament, the improvement which comprises controlling the acid dyeability level of the filament being spun by:

measuring the pressure differential in the transfer line, and maintaining the pressure differential within a range of ± 7.5 psig of the base point of **1000** psig. by

increasing the temperature of the evaporator in increments of 0.05° C. to further concentrate the salt solution in the evaporator and to increase the number of amine ends in the finished polyamide as compensation for a decrease in the pressure differential, or

decreasing the temperature of the evaporator in increments of 0.05° C. to decrease the number of amine ends in the finished polyamide as compensation for an increase in the pressure differential.

3,985,715

OXAZOLIDONE DERIVATIVES OF CHLOROMETHYLATED POLYMERS AND METHODS OF MAKING THE SAME

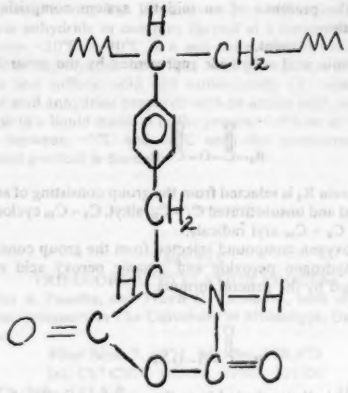
Don N. Gray, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 363,677, May 24, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 511,968

Int. Cl.² C08F 222/08, 226/06

U.S. Cl. 526—15 6 Claims

1. A resinous polymer consisting essentially of recurring units in its molecular formula as follows:



3,985,716

ESTERS OF SULFONYL DIBENZOIC ACID

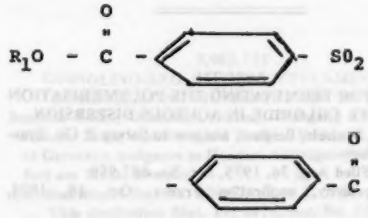
Kewal Singh Dhami, Shrewsbury, Mass., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,019

Int. Cl.² C08F 214/18; C08G 75/00

U.S. Cl. 260—79.3 R 5 Claims

1. An irradiation corsslinkable composition comprising a high temperature processing fluorocarbon polymer selected from the group consisting of polymers and copolymers of ethylene-tetrafluoroethylene, ethylene-chlorotrifluoroethylene, vinylidene fluoride, tetrafluoroethylene-vinylidene fluroide, tetrafluoroethylene-hexafluoropropylene, vinylidene fluoride-hexafluoropropylene-tetrafluoroethylene and blends thereof and as a crosslinking agent a compound of the formula:



in which R_1 and R_2 are independently selected from the group consisting of allyl and methallyl, the crosslinking agent being present in an amount of from 0.5 to 20 parts by weight per hundred parts of the fluorocarbon polymer sufficient to plasticize the polymer and to impart deformation resistance upon crosslinking.

3,985,717

VULCANIZABLE RUBBER COMPOSITIONS COMPRISING ORGANIC DERIVATIVES OF HYDRAZINE

Stanley Ashton; Peter Laithwaite, and John Anthony Taylor, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

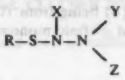
Continuation of Ser. No. 339,762, March 12, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,819

Claims priority, application United Kingdom, Mar. 22, 1972, 13408/72

Int. Cl.² C08C 19/20; C08K 5/24, 5/30

U.S. Cl. 260—79.5 R 7 Claims

1. A vulcanizable rubber composition containing an unvulcanized, sulfur-curable rubber, a vulcanizing agent for said rubber, a vulcanization accelerator for said rubber composition present in an amount of from 0.5 to 6.0% of the weight of the rubber and a hydrazine derivative present in an amount of from 0.05 to 5.0% of the weight of the rubber and having the formula:



where R is an alkyl, cycloalkyl, alkenyl or aryl group, X is an acyl group, and Y and Z together are methylidene, ethylidene, n-butylidene, isobutylidene, isopropylene, cyclohexylidene, benzylidene, diphenylmethylidene, 3-nitrobenzylidene or 4-methoxybenzylidene.

3,985,718

POLYMERIZATION OF OLEFINIC MONOMERS USING A FOUR COMPONENT INITIATOR

Henri Chabert; Robert Chapurlat, both of Lyon; Claude Gigou, Versaison, and Michel Ruaud, Villeneuve par Ternay, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 354,152, April 24, 1973, abandoned, which is a continuation of Ser. No. 794,358, Jan. 27, 1969, abandoned. This application Aug. 5, 1974, Ser. No. 495,106

Int. Cl.² C08F 2/16, 4/40

U.S. Cl. 526—113 5 Claims

1. In a process for the polymerization of an olefinic monomer selected from the group consisting of a vinyl chloride, a vinylidene chloride, ethylene, propylene, a mixture of said monomers, and a mixture of said monomer with a vinyl ester which comprises contacting said monomer, at a temperature from −30° to +100° C, with a polymerization initiator consisting essentially of a combination of (1) an oxidizing agent selected from the group consisting of hydrogen peroxide, persulphates, permanganates, chlorates, perchlorates, bichromates, bromates, ceric salts, oxaziranes, and organic peroxides and hydroperoxides, (2) a chelate compound of a metal in which compound the metal is still capable of accepting one or more electron pairs from an electron donor, the said chelate compound having the formula:

$$Xn[MQ_x(D_pA)_m]$$

in which X represents an anion or a cation; n is zero, in the case of non-ionizable chelates, or an integer or an improper fraction, in the case of ionizable chelates, equal to the number of electrical charges of the ionic grouping

$$\{MQ_x(D_pA)_m\};$$

M is titanium, iron, vanadium, aluminum, tin, manganese, chromium, cobalt, copper, zinc, or bismuth; Q is an oxygen or sulphur atom or a lower alkyl or lower alkoxy group: D is an electron doublet donor group selected from the group consisting of carbonyl, carboxyl, amino, imino, amido, hydroxy, and

mercapto; A joins together the D radicals and either is a valence bond or a hydrocarbon chain of up to 12 carbon atoms carrying the groups D terminally or at any point on or in the chain, the said chain being linear or branched and unsubstituted or substituted by an aromatic or a cycloaliphatic residue or is a polyvalent cyclic aromatic residue, *p* is an integer equal to or higher than 2, which is the number of donor groups in the ligand of formula D_pA, *s* is zero or an integer, and *m* is an integer equal to or higher than 1, *s* and *m* being such that $pm + s$ has a value lower than the maximum coordination number of the metal M, and (3) an electron donor in amount at most equal to that required to complex completely the metal of the chelate compound (2), the said electron donor being selected from the group consisting of amines, alcohols, ethers, aldehydes, ketones, imines, oximes, amides, sulphonamides, and phosphonamides, the molar proportions of said components (1) and (2) of the said initiator being each 0.0005 to 5% based on the monomer, the improvement which comprises said polymerization initiator further containing a component (4) a chelate, complex, or salt of a metal of group IB, IIB, IVB, VB, VIB, VIIB, IIA, IIIA, IVA, VA, or VIII of the Periodic Table in which the degree of coordination of the metal is different from the degree of coordination of the metal in the said chelate compound (2), the amount of component (4) being from 10^{-6} to 10^{-3} molecules per molecule of the said olefinic monomer.

3,985,719

PROCESS FOR THE CONTROLLED ALCOHOLYSIS OF ETHYLENE-VINYL ESTER INTERPOLYMERS

John M. Hoyt; Karl Koch, and Mathew Williams, Jr., all of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 516,706, Oct. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 453,242, March 21, 1974, abandoned, which is a continuation of Ser. No. 286,788, Sept. 6, 1972, abandoned. This application June 5, 1975, Ser. No. 583,943

Int. Cl.² C08F *210/00, 212/00, 218/00, 220/00*

U.S. Cl. 526—10 **16 Claims**

1. In a process for the alcoholysis of an ethylene-vinyl ester interpolymer in a reaction medium comprising as components thereof said polymer, a low-boiling alcohol, a hydrocarbon solvent in an amount up to 1,000 parts by weight per part of the alcohol and an alkaline or acidic catalyst, wherein the aggregate initial amount of water contained in the polymer, the alcohol, the hydrocarbon solvent and the catalyst prior to the alcoholysis reaction is no more than 10% of the total weight thereof; the improvement comprising regulating the aggregate water content of said components introduced into a single alcoholysis reaction and into successive, otherwise identical alcoholysis reaction runs as not to vary by more than 50% by weight of said aggregate water content thereof, maintaining the reaction medium throughout the reaction and throughout successive reaction runs under a dry, inert atmosphere and otherwise carrying out the alcoholysis under conditions preventing the addition or loss of substantial quantities of water to or from said medium, to obtain a partially hydrolyzed polymer having a predetermined residual vinyl ester content.

3,985,720

POLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMER EMPLOYING A CATALYST SYSTEM COMPRISING DIALKYLPYROCARBONATE, ORGANIC ACID ANHYDRIDE, ALKALINE REAGENT AND H_2O_2

James A. Manner, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 30, 1975, Ser. No. 582,499

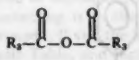
Int. Cl.² C08F *114/02, 114/16;* **C08G** *2/00, 63/12*

U.S. Cl. 526—220 **28 Claims**

1. In the process for polymerizing ethylenically unsaturated material susceptible to polymerization with free radical type initiators in an aqueous or bulk polymerization medium, the improvement which comprises conducting said polymerization in the presence of an initiator system comprising, in combination,

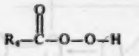
a. alkaline reagent,

b. organic acid anhydride represented by the general formula:



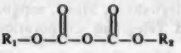
wherein R_3 is selected from the group consisting of substituted and unsubstituted $C_1 - C_{20}$ alkyl, $C_6 - C_{10}$ cycloalkyl, and $C_6 - C_{10}$ aryl radicals,

c. peroxygen compound selected from the group consisting of hydrogen peroxide and organic peroxy acid represented by the general formula:



wherein R_4 is selected from the group consisting of substituted and unsubstituted $C_1 - C_{20}$ alkyl and $C_6 - C_{10}$ aryl radicals, and

d. dialkyl pyrocarbonate represented by the general formula:



wherein R_1 and R_2 are each selected from the group consisting of $C_1 - C_{20}$ alkyl, $C_6 - C_{12}$ cycloalkyl, $C_7 - C_{10}$ aralkyl having a single aromatic ring, and $C_6 - C_8$ aryl radicals, the mole ratio of dialkyl pyrocarbonate to acid anhydride being between about 0.1:1 and about 10:1, said acid anhydride, peroxygen compound and pyrocarbonate being present in amounts sufficient to generate, in the presence of said alkaline reagent, an initiating amount of initiator and thereby polymerize the ethylenically unsaturated material.

3,985,721

PROCESS FOR TERMINATING THE POLYMERISATION OF VINYL CHLORIDE IN AQUEOUS DISPERSION

André Petit, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed Aug. 26, 1975, Ser. No. 607,958

Claims priority, application France, Oct. 18, 1974, 74.35507

Int. Cl.² C08F *2/42, 14/06*

U.S. Cl. 526—84 **8 Claims**

1. Process for terminating the polymerisation of vinyl chloride in aqueous dispersion, wherein 8-hydroxyquinoline is introduced into the aqueous dispersion.

3,985,722

PROCESS FOR PREPARING N-HIGHER ALIPHATIC ACYL DERIVATIVES OF AMINO ACIDS, PEPTIDES OR PROTEINS

Ryonosuke Yoshida, Kamakura, and Takashi Shishido, Kawasaki, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Dec. 9, 1974, Ser. No. 530,989

Claims priority, application Japan, Dec. 12, 1973, 48-138975; June 8, 1974, 49-64589

Int. Cl.² C07C *103/52*; C07G *7/00*

U.S. Cl. 260—112 R 10 Claims

1. A process for preparing N-higher aliphatic acyl derivatives of amino acids, peptides or proteins which comprises the following steps: (1) reacting a mole of a tertiary amine salt of a fatty acid having 6 to 22 carbon atoms with 1 to 2 moles of sulfuric anhydride or complex thereof at a temperature ranging from −20°C to 40°C in a non-aqueous solvent to form a mixed acid anhydride of a fatty acid having 6 to 22 carbon atoms and sulfuric acid and subsequently (2) reacting the mixed acid anhydride prepared with an amino acid, peptide or protein in a liquid medium in the presence of base at temperatures between −5°C and 40°C until the corresponding N-acylated product is formed.

3,985,723

TRIFLUOROACETYLATION PROCESS

Charles A. Panetta, and Travis G. Casanova, both of Oxford, Miss., assignors to The University of Mississippi, University, Miss.

Filed Sept. 7, 1971, Ser. No. 178,473

Int. Cl.² C07C *103/52*, *99/00*, *101/00*

U.S. Cl. 260—112.5 R 10 Claims

1. A process for N-trifluoroacetylating an amino compound having at least one hydrogen atom at the nitrogen atom comprising reacting said amino compound with sym-trichlorotrifluoroacetone.

3,985,724

1-(4'-DIAZONIUMPHENYL)-PYRIDINIUM SALTS AND THE PROCESS OF PREPARATION

Hermann Hoffmann; Byron G. Held; Harry E. Green, and Harold E. Van Essen, all of Charles City, Iowa, assignors to Salsbury Laboratories, Charles City, Iowa

Filed Oct. 15, 1974, Ser. No. 514,664

Int. Cl.² C07C *113/00*; C09B *29/12*, *29/36*; D06P *1/04*

U.S. Cl. 260—141 7 Claims

1. The compound 1-(4'-diazoniumphenyl)-1,2-dihydropyrid-2-imino-sulfinate.

3,985,725

QUINOLINO-AZO-ACETO-ACETYLAMINOBENZIMIDAZOLONE PIGMENTS FAST TO HEAT

Joachim Ribka, Offenbach (Main); Wolfgang Rieper, Frankfurt am Main, and Reinhard Zunker, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

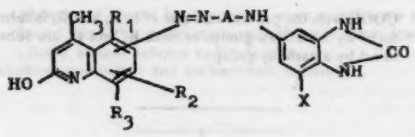
Continuation of Ser. No. 320,572, Jan. 2, 1973, abandoned. This application Mar. 17, 1975, Ser. No. 558,955

Claims priority, application Germany, Jan. 3, 1972, 2200112

Int. Cl.² C09B *29/36*; D06P *1/08*, *3/24*, *3/52*

U.S. Cl. 260—155 5 Claims

1. A monoazo dyestuff of the formula



wherein R_1, R_2 and R_3 each are hydrogen, alkyl with 1–4 carbon atoms, alkoxy with 1–4 carbon atoms, chlorine or bromine, X is hydrogen, chlorine or bromine and A is acetoacetyl.

3,985,726

BENZISOTHIAZOLE AND INDAZOLE AZO COMPOUNDS

Klaus Artz, Muttenz, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

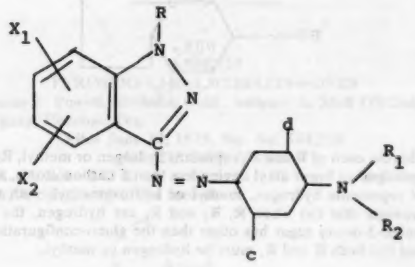
Continuation of Ser. No. 166,980, July 28, 1971, abandoned. This application Nov. 21, 1973, Ser. No. 418,007

Claims priority, application Switzerland, Aug. 7, 1970, 11912/70

Int. Cl.² C09B *29/08*

U.S. Cl. 260—162 3 Claims

1. An azo compound free of sulfonic acid groups, of the formula



wherein X_1 and X_2 are independently selected from the group consisting of hydrogen, nitro, chloro, bromo and methyl;

R is hydrogen,

c and *d* each are hydrogen, methyl, ethyl, methoxy, ethoxy, phenylthio or phenoxy and

c additionally denotes chlorine, bromine, trifluoromethyl, acetylamino, propionylamino, methylsulfonylamino, ethylsulfonylamino, p-toluenesulfonylamino, methoxycarbonyl, phenoxycarbonyl, aminocarbonyl, benzyl, —NH—CO—$(CH_2)_n$—COOH, where n=0, 1, 2, or 3, or —NH—CO—CH=CH—COOH; and

R_1 and R_2 are each hydrogen, lower alkyl, benzyl, β-phenylethyl, β-chloroethyl, β,β,β-trifluoroethyl, β,γ-dichloropropyl, β-cyanoethyl, β-ethoxyethyl, δ-methoxybutyl, glycidyl, β-hydroxyethyl, β,γ-hydroxypropyl, β-nitroethyl, β-carbo-(methoxy-, ethoxy- or propoxy-) ethyl, β- or γ-carbo-(methoxy- or ethoxy-) propyl, β-(acetyl- or formyl-) aminoethyl, β-acetoxyethyl, β,γ-diacetoxypropyl, γ-butyryloxypropyl, β-phenylsulphonylethyl, β-toluenesulphonylethyl, β-(p-chlorobenzenesulfonyl)ethyl, β-methylcarbamyloxyethyl, β-phenylcarbamyloxyethyl, β-(methoxy-, ethoxy or isopropoxy-)carbonyloxyethyl, γ-acetamidopropyl, β-(p-nitrophenoxy)ethyl, β-(p-hydroxyphenoxy)ethyl, β(β'-acetylethoxycarbonyl)ethyl, β-[(β'-cyano-, hydroxy-; methoxy- or acetoxy-) ethoxycarbonyl] ethyl, cyanoethoxyethyl, —C_2—C_3-alkylene—COOH, β-acetylethyl, γ-aminopropyl, β-diethylaminoethyl, β-cyanoacetoxyethyl, carboxyphenyl or —C_2H_4—O—CO—CH=CH—

COOH with the proviso that one of *c*, R_1 and R_2 is substituted by a carboxy group, or both R_1 and R_2 are substituted by a carboxy group.

3,985,727

AMINOGLYCOSIDE ANTIBIOTICS

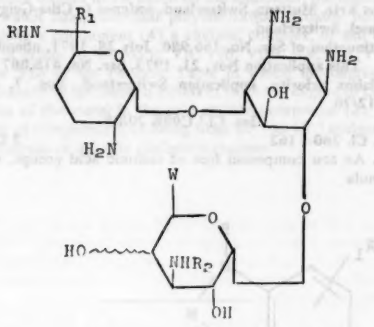
Peter J. L. Daniels, Cedar Grove, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Mar. 28, 1975, Ser. No. 563,046

Int. Cl.² C07H *15/22*

U.S. Cl. 536—17 **20 Claims**

1. Compounds having the structural formula:



wherein each of R and R_1 represent hydrogen or methyl, R_2 is hydrogen or lower alkyl having less than 5 carbon atoms, and W represents hydrogen, methyl or hydroxymethyl, with the provisos that (a) when R, R_1 and R_2 are hydrogen, the 3-amino-3-deoxy sugar has other than the gluco-configuration, and (b) both R and R_1 must be hydrogen or methyl.

3,985,728

CARBOXYMETHYLATED MATERIALS DERIVED FROM WOOD MOLASSES AND PROCESS FOR MAKING SAME

Stephen Y. Lin, Mount Pleasant, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,147

Int. Cl.² C08B *15/02*

U.S. Cl. 536—120 **11 Claims**

1. An oligomeric carboxymethyl wood molasses, the amount of carboxymethylation being about 50 parts by weight to 200 parts by weight per 100 parts wood molasses.

3,985,729

SUBSTITUTED 7,12-METHANO DIBENZAZOCINES

William H. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

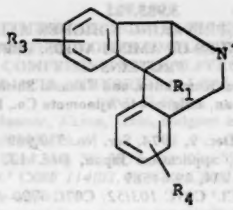
Filed Dec. 23, 1974, Ser. No. 536,935

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07D *225/04*

U.S. Cl. 260—239 D **15 Claims**

1. A compound of the formula:



where

R_1 is straight chain lower alkyl

R_2 is hydrogen or lower alkyl and

R_3 and R_4 each independently is hydrogen, halo having an atomic weight of about 19 to 35, lower alkyl or lower alkoxy and pharmaceutically acceptable acid addition salts thereof.

3,985,730

5-ALKYL-10-(AMINOCARBONYL/AMINOMETHYL/-CYANO)-10,11-DIHYDRO-5H-DIBENZ[B,F]AZEPINE-10-ALKANAMINES

John W. Cusic, Skokie, and Charles R. Ellefson, Chicago, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

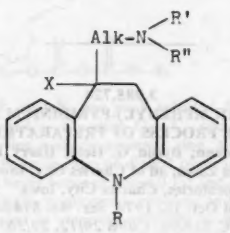
Filed Nov. 4, 1974, Ser. No. 520,256

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07D *223/22*

U.S. Cl. 260—239 D **15 Claims**

1. A compound of the formula



wherein X represents aminocarbonyl aminomethyl, or cyano; Alk represents alkylene containing two or three carbons; R and R′ each represent alkyl containing fewer than eight carbons; and R″ represents hydrogen, alkyl containing fewer than eight carbons, or benzyl.

3,985,731

2H-2-BENZAZEPIN-1,3-DIONES

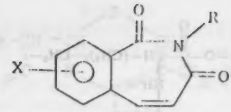
Berthold Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 484,908, July 1, 1974, Pat. No. 3,887,544. This application Mar. 28, 1975, Ser. No. 563,265

Int. Cl.² C07D *223/16*

U.S. Cl. 260—239.3 B **8 Claims**

1. A compound of the formula



wherein X is hydrogen, alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, halogen, CF_3 or NO_2, and R is alkyl of from 1 to 4 carbons, allyl, dialkylaminoalkyl wherein each alkyl group may have from 1 to 3 carbon atoms or hydrogen, provided that when R is hydrogen X is other than hydrogen, and pharmaceutically acceptable acid addition salts thereof when R is dialkylamino alkyl as previously defined.

3,985,732

1,2,3,11a-TETRAHYDRO-10-METHYL-5H-PYRROLO[2,1-c][1,4]BENZODIAZEPIN-5,11(10H)-DIONES

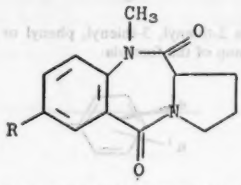
William Blythe Wright, Jr., Woodcliff Lake, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 464,424, April 26, 1974, abandoned. This application July 31, 1975, Ser. No. 601,130

Int. Cl.² C07D *487/04*

U.S. Cl. 260—239.3 T **5 Claims**

1. A dextrorotatory or racemic form of a compound of the formula:



wherein R is hydrogen or fluoro.

3,985,733

STEREOSPECIFIC TOTAL STEROIDAL SYNTHESIS VIA SUBSTITUTED C/D-TRANS INDANONES

Zoltan George Hajos, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

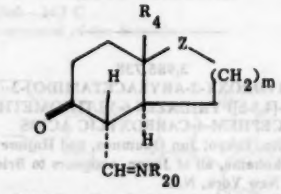
Division of Ser. No. 765,023, Oct. 4, 1968, Pat. No. 3,897,460. This application June 24, 1974, Ser. No. 482,709

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07C *119/00*

U.S. Cl. 260—240 G **1 Claim**

1. A compound of the formula



wherein R_4 is hydrogen or lower alkyl; Z is carbonyl, lower alkylenedioxy or $CH(OR_5)$; *m* is an integer having the value of 1 or 2; R_5 is hydrogen, lower alkyl, phenyl-lower alkyl, tetrahydropyranyl, lower alkanoyl, benzoyl, nitrobenzoyl, carboxy-lower alkanoyl, carboxy-benzoyl, trifluoroacetyl, or camphorsulfonyl and R_{20} is lower alkyl, phenyl and phenyl having one or more substituents selected from the group consisting of lower alkyl, lower alkoxy, amino, halogen and hydrogen its optical enantiomer and the racemate thereof.

3,985,734

METHOD FOR THE PREPARATION OF THE COPPER COMPLEX OF 6-METHOXY-1-PHENAZINOL 5,10-DIOXIDE

Joseph Donald Surmatis, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 226,305, Feb. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 139,288, April 23, 1971, abandoned. This application Feb. 13, 1974, Ser. No. 442,297

Int. Cl.² C07D *241/46*

U.S. Cl. 260—242 **4 Claims**

1. A solid-state reaction method for the preparation of the cupric complex of 6-methoxy-1-phenazinol 5,10-dioxide which comprises reacting, in a water reaction medium, an agitated suspension of solid 6-methoxy-1-phenazinol 5,10-dioxide crystals with a water-soluble cupric salt.

3,985,735

PYRIMIDO(4,3-b)(1,3)THIAZIN-6-ONES

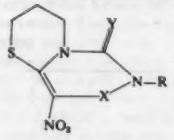
James E. Powell, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed June 30, 1975, Ser. No. 591,738

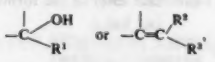
Int. Cl.² C07D *279/08*

U.S. Cl. 260—243 R **3 Claims**

1. A compound of the formula



wherein Y is oxygen or sulfur, R contains up to 20 carbon atoms and is (a) straight-chain or branched-chain alkyl or alkenyl; or (b) cycloalkyl, phenyl, phenalkyl, phenylcycloalkyl, or these substituted by one or more of halogen, straight-chain or branched-chain alkyl or alkoxy of from one to six carbon atoms, nitro or cyano; and X is



wherein R^1 is hydrogen; phenyl or phenyl substituted as indicated above; vinyl, mono- or polyhalovinyl; ethinyl or 2-phenylethinyl, optionally substituted on the ring as indicated above; or is

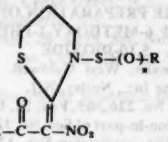
wherein each of R^4 independently is methyl, halogen or phenyl optionally substituted as indicated above; R^3 and R^3 each is hydrogen, straight-chain or branched-chain alkyl of from 1 to ten carbon atoms, phenyl or phenyl substituted as indicated above.

3,985,736
N-(SULFUR-SUBSTITUTED)-2H-1,3-THIAZIN-2-YLIDENE NITROMETHYL KETONES AND NITROACETIC ACID ESTERS

James E. Powell, Modesto, and Steven A. Roman, Oakdale, both of Calif., assignors to Shell Oil Company, Houston, Tex.

Filed July 2, 1975, Ser. No. 592,432
Int. Cl.² C07D 279/04
U.S. Cl. 260—243 R 2 Claims

1. A compound of the formula:



wherein *n* is zero, one or two, R is straight-chain or branched-chain alkyl of from one to ten carbon atoms, phenyl or phenyl substituted by one or more of halogen, nitro, cyano, straight-chain or branched-chain alkyl or alkoxy of from 1 to 6 carbon atoms, and X is hydrogen or is R^1, R^1—O— or R^1—S— wherein R^1 contains up to ten carbon atoms and is

a. straight-chain or branched-chain alkyl, alkenyl, alkynyl, haloalkyl, haloalkenyl, mono- and poly(alkoxy)alkyl, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, cycloalkyl, cycloalkylalkyl, phenylthioalkyl, phenylsulfinylalkyl, phenylsulfonylalkyl;

b. phenyl or phenalkyl or either substituted on the ring by one to two of one or more of halogen, nitro, cyano, alkyl, phenyl, alkoxy or phenoxy;

c. where X is R^1—O— or R^1—S—, R^1 is $(CH_2)_mNR^2R^3$, wherein *m* is one or two, R^2 is alkyl, alkenyl, cycloalkyl, phenyl or phenalkyl and R^3 is one of the moieties represented by R^2; or

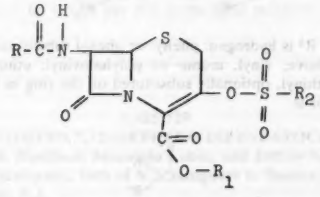
d. is (CH_2)—R^4, wherein *n* is zero, one or two, and R^4 is one of furanyl, tetrahydrofuranyl, dioxolanyl, thienyl, thiopyranyl, pyridinyl, pyrrolidinyl, morpholinyl and their -methyl and -ethyl counterparts.

3,985,737
3-SULFONATE ESTERS OF CEPHALOSPORIN

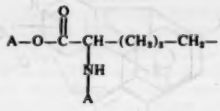
Wayne A. Spitzer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 6, 1974, Ser. No. 439,207
Int. Cl.² C07D 501/20
U.S. Cl. 260—243 C 11 Claims

1. A 3-cephem-3-sulfonate ester of the formula

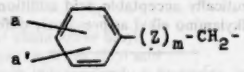


wherein R is C_1–C_8 alkyl, C_1–C_3 haloalkyl, C_1–C_3 cyanoalkyl, phenyl, methylphenyl, hydroxyphenyl, halophenyl, nitrophenyl, aminophenyl, methoxyphenyl, 4-amino-4-carboxybutyl, or a 4-substituted-amino-4-carboxybutyl ester group of the formula



wherein A is diphenylmethyl, p-nitrobenzyl, benzyl, 2,2,2-trichloroethyl, t-butyl, or p-methoxybenzyl and A′ is C_2–C_4 alkanoyl, C_2–C_4 haloalkanoyl, benzoyl, nalobenzoyl, 2,4-dinitrophenyl, or phthaloyl;

or R is a group of the formula

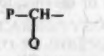


wherein a and a′ independently are hydrogen, C_1–C_4 lower alkyl, C_1–C_4 lower alkoxy, halogen, hydroxy, nitro, amino, or carboxy;

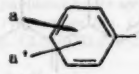
Z is O or S; and

m is O or 1;

or R is a group of the formula



wherein P is 2-thienyl, 3-thienyl, phenyl or a substituted phenyl group of the formula



wherein *a* and *a′* are as defined above, Q is hydroxyl, formyloxy, acetoxy, carboxy, sulfo, amino, or amino protected by t-butyloxycarbonyl, 2,2,2-trichloroethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl or by an enamine formed with ethyl acetoacetate or acetylacetone;

or R is a group of the formula

wherein R′ is 2-thienyl, 3-thienyl, 2-furyl, 2-oxazolyl, 2-thiazolyl or 1-tetrazolyl

R_2 is C_1–C_8 alkyl, phenyl, halophenyl, C_1–C_3 lower alkylphenyl, or nitrophenyl;

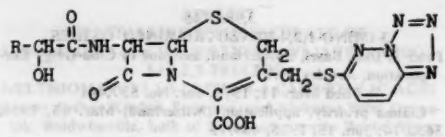
R_1 is hydrogen, benzyl, 4-methoxybenzyl, 4-nitrobenzyl, diphenylmethyl, 2,2,2-trichloroethyl or t-butyl; and when R_1 is hydrogen the pharmaceutically acceptable non-toxic salts thereof.

3,985,738
7-(D-α-HYDROXY-2-ARYLACETAMIDO)-3-(TETRAZOLO-[4,5-b]PYRIDAZIN-6-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACIDS

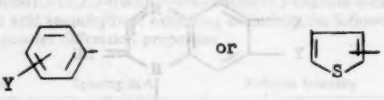
Takayuki Naito, Tokyo; Jun Okumura, and Hajime Kamachi, both of Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed May 24, 1974, Ser. No. 473,040
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976
Int. Cl.² C07D 501/20
U.S. Cl. 260—243 C 54 Claims

1. An acid having the D configuration in the 7-sidechain and the formula



wherein R is



and Y is hydrogen, chlorine, bromine, fluorine, trifluoromethyl, amino, nitro, hydroxy, lower alkyl of 1–4 carbon atoms or lower alkoxy of 1–4 carbon atoms.

3,985,739

3-HETEROCYCLIC THIOMETHYLCEPHALOSPORINS

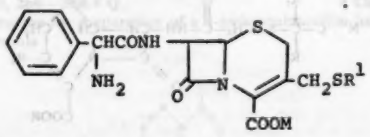
George L. Dunn, Wayne, and John R. E. Hoover, Glenside, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation of Ser. No. 289,499, Sept. 15, 1975, Pat. No. 3,855,213, which is a continuation-in-part of Ser. No. 262,903, June 14, 1972, Pat. No. 3,867,380, which is a continuation-in-part of Ser. No. 116,599, Feb. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 116,598, Feb. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 99,296, Dec. 17, 1970, abandoned. This application Oct. 1, 1974, Ser. No. 510,947

Int. Cl.² C07D *501/24*

U.S. Cl. 260—243 C **4 Claims**

1. A compound of the formula



in which

R^1 is 1,2,4-triazolyl, substituted with cyclopropyl, allyl, and methoxymethyl, and

M is hydrogen or an alkali metal,

or a pharmaceutically acceptable salt thereof.

3,985,740

7-[D-(α-AMINO-α-PHENYL-, 2-THIENYL- AND 3-THIENYLACETAMIDO)]-3-(5-METHYLTHIAZOL-2-YL)CARBONYLTHIOMETHYL-3-CEPHEM-4-CARBOXYLIC ACIDS

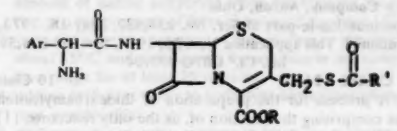
John Michael Essery, and Lee Cannon Cheney, both of Fayetteville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed July 26, 1974, Ser. No. 492,123

Int. Cl.² C07D *501/36*

U.S. Cl. 260—243 C **32 Claims**

1. A compound having the D-configuration in the 7-side-chain and the formula



wherein Ar is phenyl, 2-thienyl or 3-thienyl; R is hydrogen, pivaloyloxymethyl, acetoxymethyl, methoxymethyl, acetonyl or phenacyl; and R′ is 5-methyl-2-thiazolyl; or a pharmaceutically acceptable salt thereof.

3,985,741

PRODUCTION OF p-HYDROXYCEPHALEXIN

Leonard Bruce Crast, Jr., Clay, and William Joseph Gottstein, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 289,703, Sept. 15, 1972, abandoned. This application Oct. 18, 1974, Ser. No. 516,047

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² C07D *501/12*

U.S. Cl. 260—243 C **2 Claims**

1. The process of purifying a crude form of 7-(D-α-amino-4-hydroxyphenylacetamido)-3-cephem-4-carboxylic acid which comprises converting said crude acid to its solid, crystalline dimethylformamide solvate containing 1.5 moles dimethylformamide per mole of said acid, isolating said solid solvate, slurrying it in nearly boiling methanol, preferably at about 50° C., until the solvate dissociates, cooling the suspension and then collecting therefrom substantially pure, solid 7-(D-α-amino-4hydroxyphenylacetamido)-3-cephem-4-carboxylic acid.

2. Substantially pure, crystalline dimethylformamide solvate of 7-(D-α-amino-4-hydroxyphenylacetamido)-3-cephem-4-carboxylic acid containing 1.5 moles dimethylformamide per mole of said acid.

3,985,742

PROCESS FOR PREPARING 3-HYDROXYMETHYL CEPHALOSPORINS

Edward O. Stapley, Metuchen, N.J., and Justo M. Mata, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 203,896, Dec. 1, 1971, abandoned, which is a continuation-in-part of Ser. Nos. 19,496, March 13, 1970, abandoned, Ser. No. 51,319, June 30, 1970, abandoned, Ser. No. 96,594, Dec. 9, 1970, abandoned, and Ser. No. 115,779, Feb. 16, 1971, abandoned. This application Feb. 18, 1975, Ser. No. 550,235

Int. Cl.² C07D *501/04*

U.S. Cl. 260—243 C **1 Claim**

1. A method for the preparation of a salt of 7β-(D-5-amino-5-carboxyvaleramido)-3-(hydroxymethyl)-7-methoxy-3-cephem-4-carboxylic acid; which comprises treating a diester of 7β-(D-5-amino-5-carboxyvaleramido)-3-(carbamoyloxymethyl)-7-methoxy-3-cephem-4-carboxylic acid in which the

5-amino group has been blocked, with nitrosyl chloride to afford the corresponding diester of 7β-(D-5-amino-5-carboxyvaleramido)-3-(hydroxymethyl)-7-methoxy-3-cephem-4-carboxylic acid which, when subjected to catalytic hydrogenation and treatment with hydrazine hydrate in a basic solution, affords the desired product.

3,985,743

PREPARATION OF THIOCARBAMYLSULFENAMIDES

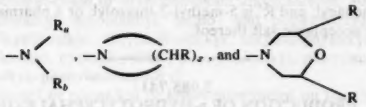
Ray D. Taylor, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 254,532, May 18, 1972, abandoned. This application Nov. 25, 1974, Ser. No. 526,591

Int. Cl.² C07C *155/04*

U.S. Cl. 260—246 B 10 Claims

1. A process for the preparation of thiocarbamylsulfenamides comprising the reaction of, as the only reactants, (1) a monohaloamine of the formula X—A, wherein X is selected from the class consisting of —Cl, —Br, and —I, and A is selected from the group consisting of



where R_a and R_b are selected from the group consisting of hydrogen, alkyl having 1 to 24 carbon atoms, cyanoalkyl having 2 to 12 carbon atoms, alkoxyalkyl having 2 to 12 carbon atoms total, alkenyl having 2 to 18 carbon atoms, cycloalkyl having 4 to 8 carbon atoms in the ring, phenyl and benzyl; and $x = 4$ to 7, and R is selected from the group consisting of hydrogen and alkyl having 1 to 2 carbon atoms, (2) an amine of the formula H—A, wherein A is defined as above, and (3) carbon disulfide, said reaction conducted at a temperature from about −20° C. to about 100° C. in the presence of a base selected from the group consisting of alkali metal hydroxides, alkali metal alcoholates wherein the alcohol is an aliphatic alcohol containing 1 to 10 carbon atoms and an alkali metal salt of an acid selected from the group consisting of formic acid, acetic acid, citric acid, levulinic acid, benzoic acid, salicylic acid, boric acid, phosphoric acid, and carbonic acid.

3,985,744

PRODUCTION OF GRANULAR SODIUM DICHLOROISOCYANURATE

James L. Manganaro, Hightstown, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 342,511, March 19, 1973, Pat. No. 3,886,249. This application Mar. 13, 1975, Ser. No. 558,092

Int. Cl.² C07D *251/28*

U.S. Cl. 260—248 C 9 Claims

1. A process for producing flowable granular anhydrous sodium dichloroisocyanurate which comprises:

a. compacting, granulating and sizing powdered sodium dichloroisocyanurate dihydrate to obtain a granular dihydrate product, at least 60% by weight having a screen size of −10 to +70 mesh; and

b. drying said granular dihydrate product to produce an anhydrous product having from about zero to about 6% by weight of water, a bulk density of about 0.84 to about 0.94 g/cc and at least 60% by weight having a particle size of −10 to +70 mesh.

3,985,745

3-IMINO-1,2,4-BENZOTRIAZINE-1-OXIDES

Peter J. Diel, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

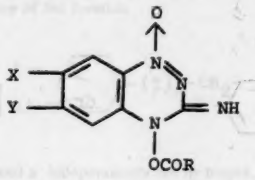
Filed Mar. 11, 1975, Ser. No. 557,441

Claims priority, application Switzerland, Mar. 15, 1974, 3632/74; Jan. 15, 1975, 409/75

Int. Cl.² C07D *253/08*

U.S. Cl. 260—249.5 4 Claims

1. A 3-Imino-1,2,4-benzotriazine-1-oxide of formula I



(I)

wherein

R represents C_1–C_{18} alkyl, C_3–C_{18} alkenyl or C_1–C_4 haloalkyl, phenyl benzyl, phenethyl or phenylpropyl optionally substituted by C_1–C_8 alkyl, C_1–C_8 alkoxy, trifluoromethyl, halogen or hydroxy,

X and Y each independently represent hydrogen, halogen, C_1–C_8 alkyl or C_1–C_8 alkoxy, or one of the two symbols represents a phenoxy or phenylsulphonyl radical optionally substituted by halogen, C_1–C_8 alkyl, trifluoromethyl or C_1–C_8 alkoxy.

3,985,746

7-(α-CYANOMETHYLTHIO)ACETAMIDO-3-CEPHEM CARBOXYLATES

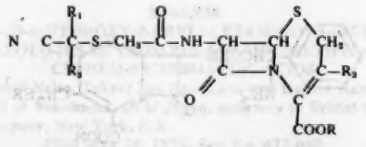
William Henry Koster, Pennington; William A. Slusarchyk, Belle Mead, and Jack Bernstein, New Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 25, 1975, Ser. No. 561,814

Int. Cl.² C07D *501/16*

U.S. Cl. 260—243 C 14 Claims

1. A compound of the formula



wherein R is hydrogen, alkali metal, lower alkyl, phenyl-lower alkyl, substituted phenyl-lower alkyl wherein the phenyl substituents are nitro or lower alkyoxy, or benzhydryl; R_1 and R_2 each is hydrogen or lower alkyl; and R_3 is hydroxy, chloro, bromo, fluoro or lower alkoxy said lower alkyl and lower alkoxy groups having one to seven carbons.

3,985,747

CRYSTALLINE SESQUIHYDRATE OF 7-[D-α-AMINO-α-(p-HYDROXYPHENYL)ACETAMIDO]-3-(1,2,3-TRIAZOL-5-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACID

Murray Arthur Kaplan, Syracuse, and Alphonse Peter Granatek, Baldwinsville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed May 24, 1974, Ser. No. 473,039

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² C07D *501/20*

U.S. Cl. 260—243 C 1 Claim

1. Crystalline 7-[D-α-amino-α-(p-hydroxyphenyl)-acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid sesquihydrate exhibiting essentially the following X-ray powder diffraction properties:

Line	Spacing d(A)	Relative Intensity
1	9.31	45
2	6.77	93
3	6.17	32
4	5.56	14
5	4.42	100
6	3.97	76
7	3.78	95
8	3.55	55
9	3.41	53
10	3.10	26
11	3.01	19
12	2.94	9
13	2.83	17
14	2.77	23
15	2.55	19
16	2.32	10
17	2.23	12
18	2.05	10
19	1.97	6
20	1.88	7.

3,985,748

ISOCYANURATE COMPOUNDS

William J. Kauffman, Lititz, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 31, 1974, Ser. No. 537,711

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07D *251/30*

U.S. Cl. 260—248 NS 2 Claims

1. 1,3-bis(3-carbethoxypropyl)-5-phenylisocyanurate.

3,985,749

PROCESS FOR PREPARATION OF 4-AMINOQUINAZOLINE

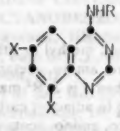
Charles H. Foster, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1975, Ser. No. 642,975

Int. Cl.² C07D *239/94*

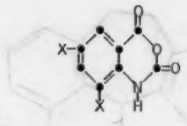
U.S. Cl. 260—256.4 Q 4 Claims

1. Process for preparation of a 4-aminoquinazoline having the formula



which comprises the steps of

1. reacting an isatoic anhydride having the formula



with an equimolar amount of ammonia in the presence of dimethyl formamide, the weight of dimethyl formamide to isatoic anhydride being from about 1:1 to about 10:1;

2. adding to the solution from about 1 to about 2 mole proportions of phosphorous oxychloride based on the amount of isatoic anhydride while maintaining the solution at a temperature of from about −10° to about 15° C.;
3. increasing the temperature of the solution to about 40° to about 55° C. and maintaining the solution in this temperature range for at least 20 minutes;
4. adding sufficient water to hydrolyze any excess phosphorous oxychloride;
5. adding to the reaction mixture at least one mole proportion based on the amount of isatoic anhydride in step (1) of an amine having the formula R—NH_2 and sufficient base to render the mixture neutral or basic;
6. heating the reaction mixture at a temperature from about 70° to about 100° C. for at least about 15 minutes; and
7. recovering the 4-aminoquinazoline;

wherein each X is the same or different and represents hydrogen, chloro, bromo or iodo; and R is hydrogen, alkyl having 1 to about 6 carbon atoms, benzyl, phenyl, m-tolyl or p-tolyl.

3,985,750

FATTY ACID ESTERS OF 8-SUBSTITUTED 10-[4-(HYDROXYALKYL)PIPERAZINO]-10,11-DIHYDRODIBENZO[b,f]THIEPINS

Miroslav Protiva; Jiri Jilek; Karel Sindelar, and Jirina Metysova, all of Praha, Czechoslovakia, assignors to SPOFA, Sdruzeni podniku pro zdravotnickou vyrobu, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 166,644, July 27, 1971, abandoned. This application July 19, 1974, Ser. No. 490,218

Claims priority, application Czechoslovakia, July 30, 1970, 5300-70; Apr. 30, 1971, 3162-71; May 10, 1971, 3371-71

Int. Cl.² C07D *409/04*

U.S. Cl. 260—268 TR 2 Claims

1. 8-methylthio-10-[4-(3-decanoyloxypropyl)piperazino]-10,11-dihydrodibenzo[b,f]thiepin.

3,985,751

BENZOCYCLOHEPTAISOQUINOLINE DERIVATIVES

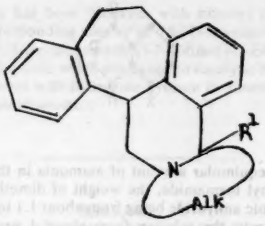
Francois T. Bruderlein, Montreal, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 242,839, April 10, 1972, Pat. No. 3,852,452, which is a continuation-in-part of Ser. No. 97,481, Dec. 20, 1970, Pat. No. 3,914,305, which is a continuation-in-part of Ser. No. 10,306, Feb. 10, 1970, Pat. No. 3,657,250. This application Oct. 29, 1974, Ser. No. 518,853

Int. Cl.² C07D *221/18*

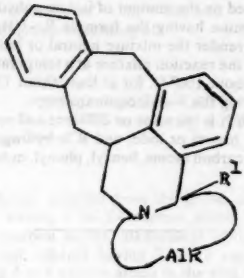
U.S. Cl. 260—283 R 9 Claims

1. A compound selected from those of the formulae



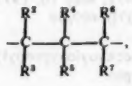
I

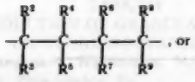
and



Ia.

in which R^1 is selected from the group which consists of hydrogen and lower alkyl containing from 1–6 carbon atoms in a straight chain and up to 4 carbon atoms in a branched chain, and Alk represents

A 

B 

C

designated A, B or C respectively, in which R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, and R^{11} are each the same or different radicals selected from the group which consists of hydrogen and lower alkyl containing from 1–6 carbon atoms in a straight chain and up to 4 carbon atoms in a branched chain, with the proviso that the carbon atom to which R^2 and R^3 are attached is bonded to the nitrogen atom of said compound, and their acid addition salts with pharmaceutically acceptable acids.

3,985,752

6-METHYL-8-(SUBSTITUTED) METHYLERGOLINES

Edmund C. Kornfeld, and Nicholas J. Bach, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

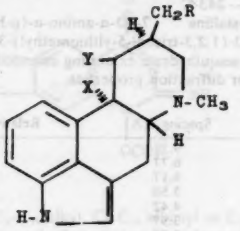
Filed Dec. 6, 1974, Ser. No. 530,318

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07D 519/02

U.S. Cl. 260—285.5 **7 Claims**

1. A compound of the formula



wherein:

X and Y each are hydrogen or, taken together, form a double bond;

R is nitro, isocyano, or CH_2R_1;

wherein:

R_1 is methylsulfinyl;

and the non-toxic pharmaceutically-acceptable acid addition salts thereof.

3,985,753

7-HYDROXY-BENZO[1J]QUINOLIZINE-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

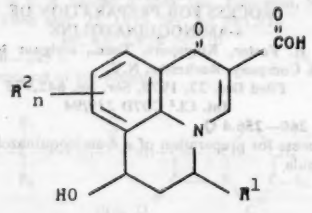
Dietrich Schuppan, Eschborn, Germany; John F. Gerster, Woodbury, Minn., and Charles M. Leir, Erin Praire Township, Saint Croix County, Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Filed Apr. 14, 1975, Ser. No. 567,510

Int. Cl.² C07D 215/56

U.S. Cl. 260—287 P **8 Claims**

1. A compound of the formula



wherein R^1 is hydrogen, methyl or ethyl; R^2 is methyl, ethyl, halogen, hydroxy, nitro, amino, acetamido or formamido; *n* is zero, one or 2, and when *n* is 2, R^2 may be methylenedioxy or ethylenedioxy bonded to adjacent carbon atoms; and when R^2 is ethyl, methoxy, nitro, amino, acetamido or formamido, and *n* is 2, each R^2 must be different; and lower alkyl ester or pharmaceutically acceptable salt derivatives thereof.

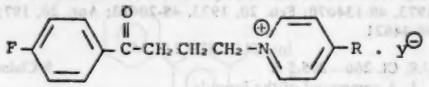
3,985,754

PARA-FLUOROBENZOYLPROPYL-N-HETEROCYCLIC SUBSTITUTED QUATERNARY SALTS

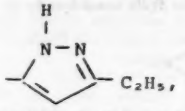
Corris Mabelle Hofmann, Ho-Ho-Kus, and Sidney Robert Safir, River Edge, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

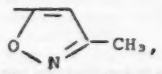
Filed May 8, 1975, Ser. No. 575,845
Int. Cl.² C07D 247/00, 277/38, 271/06, 269/00
U.S. Cl. 260—294.8 D 10 Claims

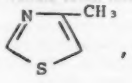
1. A compound of the formula:

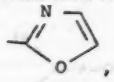


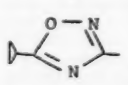
wherein R is



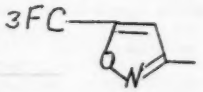








and



and y is an anion of a non-toxic inorganic halogen acid.

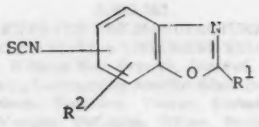
3,985,755

PYRIDINE CONTAINING ISOTHIOCYANOBENZOXAZOLES

Venkatachala L. Narayanan, Hightstown, and Rudiger D. Haugwitz, Titusville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 259,057, June 2, 1972, abandoned. This application Apr. 10, 1974, Ser. No. 459,753
Int. Cl.² C07D 413/04
U.S. Cl. 260—294.8 C 9 Claims

1. A compound of the structure



wherein R^1 is pyridyl or pyridyl substituted with alkyl; and R^2 is hydrogen, alkyl, halogen or alkoxy; wherein the terms alkyl and alkoxy refer to groups having up to 7 carbon atoms; or a physiologically acceptable acid-addition salt thereof.

3,985,756

PROCESS FOR PRODUCING AZASULFONIUM SALTS AND REARRANGEMENT THEREOF TO THIO-ETHERS

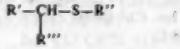
Paul G. Gassman, and Gordon D. Gruetzmacher, both of Columbus, Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Division of Ser. No. 327,294, Jan. 29, 1973, Pat. No. 3,894,034. This application Feb. 27, 1975, Ser. No. 553,602
Int. Cl.² C07D 213/38, 213/42
U.S. Cl. 260—294.8 G 15 Claims

1. A process which comprises (a) reacting a compound of the formula:

(I)

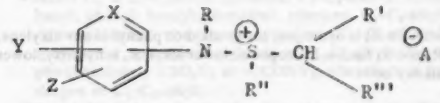
wherein R is hydrogen or a hydrocarbon radical free of aliphatic unsaturation containing 1 to 8 carbon atoms, X is —CH= or —N=, and Y and Z are hydrogen, halogen, nitro, cyano, amino, lower alkylamino, lower alkyl or lower alkyloxy, lower-alkanoyloxy or a carbonyloxy-lower alkyl, or carbonyloxy-phenyl, and A is chlorine or bromine, with a sulfide of the formula:



(II)

wherein R′ is hydrogen, lower alkyl or phenyl; R″, taken separately, is lower alkyl or phenyl, and R‴, taken separately, is hydrogen or lower alkyl, or phenyl, and R″ and R‴ when taken together with the

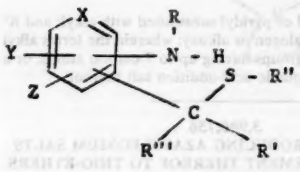
moiety denote a ring containing 3 to 5 methylene carbon atoms, under substantially anhydrous conditions, in an organic solvent for a time sufficient to form an azasulfonium salt of the formula:



(III)

wherein X, Y, Z, R, R′, R″ and R‴ are as defined above, and A is a halogen ion, or another ion which replaces the halogen ion, (b) reacting the azasulfonium salt from step (a) with a substantially anhydrous base to effect rearrangement of the azasulfonium salt and to form a thio-ether compound of the

formula:



(IV)

wherein X, Y, R, R′, R″ and R‴ are as defined above, and the hydrocarbon-S-hydrocarbyl thio-ether group is ortho to the N(—R)H group.

3,985,757

PYRAZOLOPYRIDINE KETONES

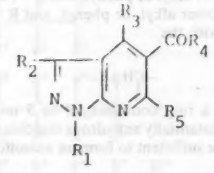
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 17, 1975, Ser. No. 614,392

Int. Cl.² C07D *213/50*

U.S. Cl. 260—294.8 C **13 Claims**

1. A compound of the formula



wherein R_1 is hydrogen, lower alkyl or phenyl-lower alkylene; R_2 and R_3 each is hydrogen or lower alkyl; R_3 is hydroxy, lower alkoxy or

wherein R_6 is hydrogen or lower alkyl and R_7 is hydrogen, lower alkyl, cyclo-lower alkyl, phenyl, phenyl-lower alkylene or di-lower alkylamino-lower alkylene; R_4 is thienyl, furanyl, or pyridyl and physiologically acceptable acid addition salts thereof.

3,985,758

1,4-DIHYDROPYRIDINE DERIVATIVES

Masuo Murakami; Kozo Takahashi, both of Tokyo; Masaru Iwanami, Yokohama; Masaharu Fujimoto, Tokyo; Tadao Shibanuma, Asaka; Ryutaro Kawai, Shiraoka, and Toichi Takenaka, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

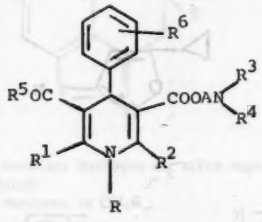
Continuation-in-part of Ser. No. 442,781, Feb. 15, 1974, abandoned. This application June 6, 1975, Ser. No. 584,268

Claims priority, application Japan, Mar. 3, 1973, 48-25566; May 11, 1973, 48-52307; July 24, 1973, 48-83276; Nov. 29, 1973, 48-134070; Feb. 20, 1973, 48-20423; Apr. 20, 1973, 48-44821

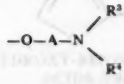
Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 R **9 Claims**

1. A compound of the formula



wherein R represents hydrogen or lower alkyl; R^1 and R^2 each represents methyl; R^3 represents phenyl, benzyl, halobenzyl, lower alkoxy-benzyl; R^4 represents hydrogen, methyl or ethyl; A represents lower alkylene; R^5 represents methyl, or lower alkoxy, or lower alkoxy substituted with lower alkoxy, or



in which R^3 and R^4 have the same meaning as above; and R^6 represents nitro or trifluoromethyl.

3,985,759

PROCESS FOR PREPARING 2-AMINO-5-CHLOROPYRIDINE

Thomas J. Kress, Indianapolis, Ind., and Larry L. Moore, Bargersville, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed June 7, 1974, Ser. No. 477,252

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07D *213/02*

U.S. Cl. 260—296 R **5 Claims**

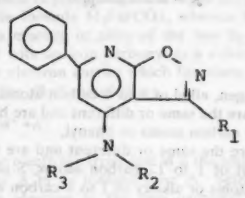
1. A process for preparing 2-amino-5-chloropyridine which comprises reacting 2-aminopyridine with no more than two equivalents of a chlorinating agent selected from the group consisting of chlorine gas, hypochlorous acid, thionyl chloride, and sulfuryl chloride in a strongly acidic medium having a Hammett acidity function less than −3.5.

3,985,760
AMINO DERIVATIVES OF 6-PHENYLISOXAZOLO[5,4-B]PYRIDINES

Hans Hoehn, Tegernheim, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 11, 1975, Ser. No. 612,413
Int. Cl.² C07D *498/04*
U.S. Cl. 260—296 H 12 Claims

1. A compound of the formula



wherein R_1 is hydrogen, lower alkyl or phenyl;

R_2 and R_3 each is hydrogen, lower alkyl, di(lower alkyl-)amino(lower alykl), phenyl, substituted phenyl wherein the phenyl substitutent is lower alkyl, carboxy or halogen, or phenyl-lower alkyl, or the group

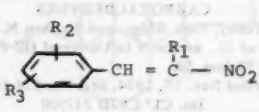
is pyrrolidine, piperidine or piperazine unsubstituted or substituted with lower alkyl or hydroxy-lower alkyl; and acid addition salts thereof.

3,985,761
NITROTHIAZOLYL DERIVATIVES OF NITROSTYRENE

Shankar Somasekhara; Dinesh Maganlal Desai, and Navinchandra Vasantrai Upadhyaya, all of Baroda, India, assignors to Sarabhai Research Centre, Baroda, India

Filed Oct. 24, 1974, Ser. No. 517,685
Int. Cl.² C07D *277/34*
U.S. Cl. 260—302 R 4 Claims

1. A compound of the formula



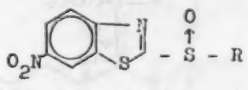
wherein R_1 is selected from the group consisting of H, CH_3 and C_2H_5, R_2 is selected from the group consisting of H, Cl and Br, and R_3 is 5-nitrothiazol-2-yl-oxy.

3,985,762
PROCESS FOR THE MANUFACTURE OF 2-ALKYLSULFINYL-6-NITROBENZ-THIAZOLES

Günter Karl Wilhelm Otto Dransch, deceased, late of Eschborn, Taunus, Germany; by Annelise Klara Helene Wiesenhütter, heiress, Eschborn, Taunus, Germany, and by Johanna Mathilde Fiersheim, heiress, Berlin, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

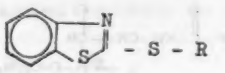
Filed Jan. 2, 1975, Ser. No. 538,162
Claims priority, application Germany, Jan. 5, 1974, 2400419
Int. Cl.² C07D *277/74*
U.S. Cl. 260—306 3 Claims

1. A process for the manufacture of a 2-alkylsulfinyl-6-nitrobenzthiazole of the formula I



I

in which R is alkyl having from 1 to 6 carbon atoms, which comprises reacting, at a temperature of from 0° to 45° C, a 2-alkylmercaptobenzthiazole of the formula II



II

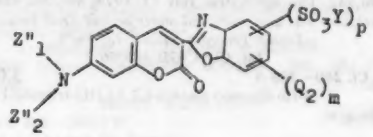
with at least 2 moles of fuming nitric acid in at least 300 grams of sulfuric acid, of at least 90 % strength, per mole of benzthiazole.

3,985,763
OXAZOLYL-ACETIC ACID DERIVATIVES AND OXAZOLYL-COUMARINES

Horst Hørnisch, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 154,652, June 18, 1971, abandoned. This application June 12, 1973, Ser. No. 369,124
Claims priority, application Germany, June 20, 1970, 2030507; Nov. 30, 1970, 2058877
Int. Cl.² C07D *413/04*
U.S. Cl. 260—307 D 13 Claims

1. Oxazolyl-courmarine having the formula



wherein Q_3 is C_1–C_5-alkyl; ;chlorine; C_1–C_5-alkoxy; cyclohexyl; phenyl; benzyl; phenethyl; phenoxy; C_1–C_5-alkylcarbonylamino; phenylcarbonylamino; C_1–C_5-alkylsulfonylamino; phenylsulfonylamino; C_1–C_5-alkylsulfonyl; phenylsulfonyl; $-SO_2V_2$ or $-CONV_2$; wherein V is hydrogen or C_1–C_5-alkyl;

Z''_1 and Z''_2 independently of one another are C_1–C_5-alkyl; C_1–C_5-alkyl substituted by mono-chlorine, mono-bromine, mono-nitrile, mono-hydroxyl or mono-C_1–C_4-alkoxy; or Z''_1 and Z''_2 are the remaining members of a pyrrolidine, piperidine or morpholine radical;

Y is hydrogen, sodium, potassium, lithium, ammonium or the cation of a basic dyestuff;

p is 0 or 1; and

m is 0, 1 or 2.

3,985,764

PRODUCTION OF FUSED OXAZOLINE AZETIDINONES

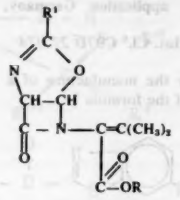
Saul Wolfe, Kingston, Canada, assignor to Queen's University, Canada

Division of Ser. No. 242,842, April 10, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,430

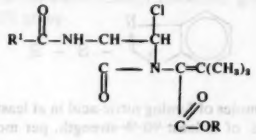
Int. Cl.[2] C07D *498/04*

U.S. Cl. 260—307 F 9 Claims

1. The process of producing a compound of the formula



wherein R^1 is benzyl or phenoxymethyl and R is (lower)alkyl, trichloroethyl, benzhydryl or benzyl which comprises the step of mixing with alumina or silica gel
a compound of the formula



wherein R and R^1 have the meaning set out above.

3,985,765

PHENYL- AND (SUBSTITUTED)-PHENYL-1,2,3-TRIAZOLE-ALKANOIC AND -ALKENOIC ACIDS

Robert Thomas Buckler, Edwardsburg, Mich.; Harold Eugene Hartzler, Elkhart, Ind., and Shin Hayao, Tokyo, Japan, assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 364,609, May 29, 1973, Pat. No. 3,900,942. This application July 12, 1974, Ser. No. 488,111

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.[2] C07D *249/06*

U.S. Cl. 260—308 A 3 Claims

1. 3-[4-(m-Bromo)-phenyl-1,2,3,(1H)-triazole-1]-propionic acid.

3,985,766

BIS-IMIDAZOLYL-BISPHENYLMETHANE AND SALTS THEREOF

Erik Regel, Wuppertal; Karl Heinz Buchel, and Manfred Plempel, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengeselischaft, Germany

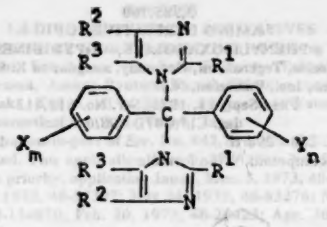
Filed Oct. 31, 1969, Ser. No. 873,098

Claims priority, application Germany, Nov. 5, 1968, 1806995

Int. Cl.[2] C07D *233/56*

U.S. Cl. 260—309 11 Claims

1. A compound of the formula:



wherein

R^1 is hydrogen, alkyl of 1 to 4 carbon atoms or phenyl,

R^2 and R^3 are the same or different and are hydrogen, alkyl of 1 to 4 carbon atoms or phenyl,

X and Y are the same or different and are halogen, NO_2, CN, alkyl of 1 to 12 carbon atoms, S-alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, and

m is 0, 1 or 2, and

n is 1 or 2 or *m* is 1 or 2 and *n* is 0, 1 or 2.

3,985,767

PROCESS FOR THE PREPARATION OF COPPER PHTHALOCYANINE

Jean-Claude René Nicaise, Creil, and Louis Antoine Cabut, Nogent sur Oise, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed June 11, 1974, Ser. No. 478,423

Claims priority, application France, June 20, 1973, 73.22421

Int. Cl.[2] C09B *47/04*

U.S. Cl. 260—314.5 9 Claims

1. A process for the preparation of copper phthalocyanine which comprises heating 4 moles of phthalodinitrile with about 1 mole of cuprous chloride at a temperature of from 140° to 300° C in the presence of 10% to 30%, with respect to the weight of phthalodinitrile, of an ammonium salt which decomposes at a temperature of from 30° to 200° C with the liberation of ammonia, the reaction being carried out in the absence of any solvent.

3,985,768

PROCESS FOR PRODUCING ROLITETRACYCLINE

Horacio Alfredo Priestap, Martinez, and Carlos Rappaport, Olivos, both of Argentina, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 23, 1975, Ser. No. 543,576

Claims priority, application Argentina, Feb. 20, 1974, 252437

Int. Cl.[2] C07D *207/06*

U.S. Cl. 260—326.33 8 Claims

1. A process for the production of rolitetracycline which comprises reacting preformed methylene-bis-pyrrolidine with tetracycline and formaldehyde or paraformaldehyde at about ambient temperature in an inert organic solvent.

3,985,769

ACETAL DERIVATIVES OF CYCLOOCTYL CARBOXALDEHYDES

Jerome A. Vesley, Park Ridge, and Stephen N. Massie, Palatine, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 15, 1974, Ser. No. 524,167

Int. Cl.[2] C07D *317/00*

U.S. Cl. 260—338 5 Claims

1. An acetal derivative of cyclooctyl carboxaldehyde.

3. The compound of claim 1 being cyclooctyl carboxaldehyde hexylene acetal.

3,985,770

METHOD OF PRODUCING ALKALI METAL TETRACARBONYLFERRATES AND SOLVATES THEREOF

James P. Collman, Stanford, and Robert G. Komoto, East Palo Alto, both of Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed June 11, 1973, Ser. No. 368,495
Int. Cl.[2] C07D 319/10
U.S. Cl. 260—340.6 8 Claims

1. In the method of producing alkali metal tetracarbonylferrates having the formula $M_2Fe(CO)_4$ wherein M is sodium, potassium or a mixture or alloy of the two by reacting the alkali metal M with an iron carbonyl in a solvent and in the presence of an electron carrier which functions to accept an electron from the alkali metal thus

$$M+A \rightarrow M^+ + A^-$$

wherein A is the electron carrier and M is the alkali metal, said electron carrier A in its ionized form A^- being capable of transferring an electron to the iron carbonyl and thereby regenerating the electron carrier A for further such electron transfer, the improvement which comprises conducting such reaction of alkali metal with iron carbonyl and so catalyzed by said electron carrier at a temperature such that the alkali metal is in the liquid state.

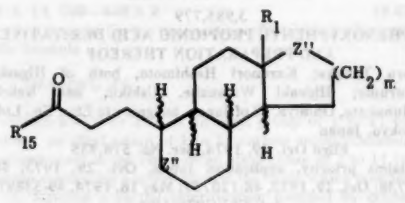
3,985,771

TOTAL STEROID SYNTHESIS EMPLOYING SUBSTITUTED ISOXAZOLE DERIVATIVES

Gabriel Saucy, Essex Fells, and John William Scott, Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 298,036, Oct. 16, 1972, Pat. No. 3,838,163, which is a division of Ser. No. 778,314, Nov. 22, 1968, Pat. No. 3,700,661. This application June 5, 1974, Ser. No. 476,372
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976
Int. Cl.[2] C07D 317/26
U.S. Cl. 260—340.9 6 Claims

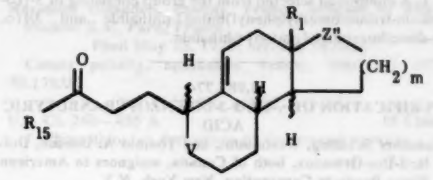
1. A compound of the formula



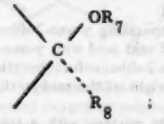
wherein Z'' is ketalized oxomethylene or a group of the formula

R_1 is a primary alkyl group from 1 to 5 carbons;
m is an integer having a value of 1 or 2; R_{15} is lower alkyl or hydrogen;
R_7 is hydrogen, lower alkyl, lower alkoxy-lower alkyl, phenyl-lower alkyl, tetrahydropyranyl or lower acyl derived from a hydrocarbyl monocarboxylic acid; and R_8 is hydrogen, lower alkyl, lower alkenyl or lower alkynyl.

3. A compound of the formula



wherein Z'' is ketalized oxomethylene or a group of the formula



m is an integer having a value of 1 or 2;
R_1 is a primary alkyl group from 1 to 5 carbons;
R_{15} is lower alkyl or hydrogen; V is ketalized oxomethylene;
R_7 is hydrogen, lower alkyl, lower alkoxy-lower alkyl, phenyl-lower alkyl, tetrahydropyranyl or lower acyl derived from a hydrocarbyl monocarboxylic acid;
and R_8 is hydrogen, lower alkyl, lower alkenyl or lower alkynyl.

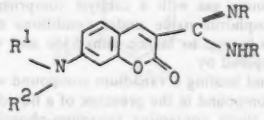
3,985,772

3-AMIDINOCOUMARIN DYES

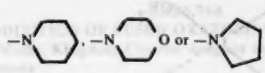
Horst Scheuermann, and Dietmar Augart, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 14, 1974, Ser. No. 433,359
Claims priority, application Germany, Jan. 13, 1973, 2301738
Int. Cl.[2] C07D 311/74
U.S. Cl. 260—343.2 R 4 Claims

1. A dye having the formula



in which
R is benzyl, phenylethyl, phenyl or phenyl substituted by methyl, ethyl, methoxy, ethoxy, chlorine or bromine;
R^1 is alkyl of 1 to 4 carbon atoms;
R^2 is alkyl of 1 to 4 carbon atoms; and
R^1 and R^2 together with the nitrogen are



3,985,773

PLANT GROWTH REGULATORS

Gerhard H. Alt, Creve Coeur, and John E. Franz, Crestwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1974, Ser. No. 536,675
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.² C07D *307/90*
U.S. Cl. 260—343.3 R 3 Claims

1. A compound selected from the group consisting of 3-[(o-halo-m-trifluoromethylphenyl)imino]-phthalide and 3-[(o, m-dimethoxyphenyl)imino]-phthalide.

3,985,774

PURIFICATION OF γ-OXO-2-DIBENZOFURANBUTYRIC ACID

Guenther Schilling, Westmount, and Thomas A. Dobson, Dollard-Des-Ormeaux, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 30, 1972, Ser. No. 302,160
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.² C07D *307/80*
U.S. Cl. 260—346.2 M 2 Claims

1. A process for separating γ-oxo-2-dibenzofuranbutyric acid from a mixture of said acid with γ-oxo-3-dibenzofuranbutyric acid, the γ-oxo-2-dibenzofuranbutyric acid constituting at least 80% by weight of the said mixture, which comprises
   1. admixing the acid mixture with a solvent comprising methanol or ethanol;
   2. esterifying the solution of the acid mixture in the presence of an acid esterification catalyst;
   3. separating the ester mixture from the solution by the addition of water and/or cooling to precipitate the resulting ester mixture;
   4. dissolving the ester mixture in toluene;
   5. fractionally precipitating the γ-oxo-2-dibenzofuranbutyric acid ester from the toluene solution; and
   6. hydrolyzing with a base the ester to provide essentially pure γ-oxo-2-dibenzofuranbutyric acid.

3,985,775

VANADIUM-PHOSPHORUS OXIDE OXIDATION OF N-BUTANE TO MALEIC ANHYDRIDE

Jonas P. Harrison, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 200,724, Nov. 22, 1971, abandoned. This application Mar. 18, 1974, Ser. No. 452,480
Int. Cl.² C07D *307/60*
U.S. Cl. 260—346.8 A 2 Claims

1. A process for producing maleic anhydride from n-butane which process comprises contacting the n-butane and an oxygen-containing gas with a catalyst comprising a mixed vanadium-phosphorus oxide under conditions sufficient to convert the n-butane to maleic anhydride and wherein the catalyst is prepared by
   a. mixing and heating a vanadium compound with a phosphorus compound in the presence of a liquid medium to obtain a slurry containing vanadium-phosphorus oxide hydrate,
   b. removing liquid medium from the slurry to obtain vanadium-phosphorus oxide dihydrate,
   c. heating the oxide dihydrate, at a temperature which is maintained between 350° and 410° C., in the presence of an oxygen-containing gas for a period of time sufficient so as to remove about one mol of the water of hydration from the oxide dihydrate and obtain a resulting monohydrate oxide, and thereafter
   d. heating the resulting monohydrate oxide at a temperature above 410° C. in the presence of an oxygen-containing gas.

3,985,776

STANNOUS STABILIZATION OF MALEIC ANHYDRIDE

Cecelia Samans, Chicago, and Martin R. Spatz, Lisle, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed July 21, 1975, Ser. No. 597,360
Int. Cl.² C07D *307/60*
U.S. Cl. 260—346.8 R 8 Claims

1. A composition comprising maleic anhydride and a heat stabilizing concentration of at least one stannous compound selected from the group consisting of stannous bromide, stannous chloride and stannous salts of aliphatic monocarboxylic acids containing 8 to 24 carbon atoms.

3,985,777

SULPHAMYL-BENZOIC ACID DERIVATIVES

Peter Werner Feit, Gentofte, Denmark, assignor to Lovens Kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

Division of Ser. No. 887,409, Dec. 22, 1969, Pat. No. 3,806,534. This application Nov. 15, 1973, Ser. No. 416,164
Int. Cl.² C07D *307/38*
U.S. Cl. 260—347.2 1 Claim

1. 3-Furfurylamino-4-phenoxy-5-sulphamyl-benzoic acid, a pharmaceutically acceptable salt or ester thereof.

3,985,778

PROCESS FOR THE PURIFICATION OF CRUDE NITROANTHRAQUINONE

Axel Vogel, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 16, 1974, Ser. No. 533,383
Claims priority, application Germany, Jan. 4, 1974, 2400253
Int. Cl.² C07C *79/36*
U.S. Cl. 260—369 4 Claims

1. A process for separating anthraquinone and 2-nitroanthraquinone from crude 1-nitroanthraquinone containing anthraquinone and 2-nitroanthraquinone which comprises adding to the crude 1-nitroanthraquinone a mixture consisting essentially of concentrated nitric acid content of at least 90% by weight and an inert organic solvent selected from the group of aliphatic and alicyclic halogenated hydrocarbons, wherein from 1 to 20 moles of concentrated nitric acid is employed per mole of combined amount of anthraquinone and 2-nitroanthraquinone in the form of a 1–35% by volume mixture with said organic solvent, and separating off the insoluble 1-nitroanthraquinone.

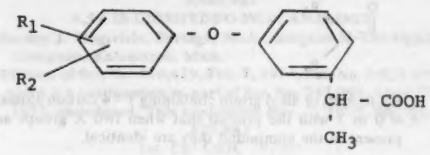
3,985,779

M-PHENOXYPHENYL PROPIONIC ACID DERIVATIVES AND PREPARATION THEREOF

Satoru Tanaka; Kazunori Hashimoto, both of Higashi-Kurume; Hideaki Watanabe, Ushiku, and Keiichi Munakata, Ohmiya, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1974, Ser. No. 518,935
Claims priority, application Japan, Oct. 29, 1973, 48-120738; Oct. 29, 1973, 48-120739; May 16, 1974, 49-53897
Int. Cl.² C07F *5/06*
U.S. Cl. 260—448 R 9 Claims

1. A 2-(m-phenoxyphenyl)propionic acid derivative represented by the formula:



wherein R_1 and R_2 are hydrogen or halogen atoms, or trifluoromethyl, lower alkyl or lower alkoxy groups with the proviso that there is no case where both R_1 and R_2 are simultaneously hydrogen atoms, and pharmacologically acceptable metal salts thereof selected from the group consisting of sodium, potassium, magnesium, calcium and aluminum.

3,985,780

β-HALOGENOETHYL-SILANES AS PLANT GROWTH REGULATORS

Werner Foery, Basel, and Hans Peter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

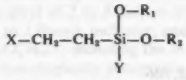
Continuation-in-part of Ser. No. 186,392, Oct. 4, 1971, abandoned. This application Feb. 15, 1974, Ser. No. 443,180

Claims priority, application Switzerland, Oct. 6, 1970, 14797/70; May 14, 1971, 7206/71

Int. Cl.² C07F *7/04, 7/18*

U.S. Cl. 260—448.8 R **4 Claims**

1. A beta-halogen-ethyl silane compound corresponding to the formula



wherein X represent chlorine or bromine, Y represents the radical $—OR_3$, and R_1, R_2 and R_3 are lower alkoxyalkyl.

3,985,781

ESTERIFICATION METHOD FOR TRICHLOROSILANE

Hans Joachim Kötzsch, Rhinefelden, and Hans Joachim Vahlensieck, Wehr, Baden, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Feb. 27, 1975, Ser. No. 553,871

Claims priority, application Germany, Mar. 1, 1974, 2409731

Int. Cl.² C07F *7/04, 7/18*

U.S. Cl. 260—448.8 R **15 Claims**

1. A process for the preparation of a trichlorosilane ester of the formula

$$H\text{-}Si(OR)_{3-n}Cl_n$$

wherein $n = 0$ or 1, R is an alkyl group of 1 to 11 carbon atoms, an alkyl group of 1 to 11 carbon atoms containing an oxygen atom in the chain or an alkyl group of 1 to 11 carbon atoms containing a sulfur atom in the chain which comprises

1. forming a partial esterification product by contacting trichlorosilane with up to a 10% stoichiometric excess of a primary alcohol, the stoichiometric amount corresponding to only partial esterification of said trichlorosilane, said contacting being conducted only in the liquid phase and without contact in the vapor phase;
2. removing HCl formed from the reaction vessel;
3. thereafter contacting the partial esterification product with additional primary alcohol and removing liberated residual HCl from the reaction vessel.

3,985,782

PHENYLTHIOUREA DERIVATIVES

Raymond Giraudon, Lesigny, France, assignor to Rhone-Poulenc S.A., Paris, France

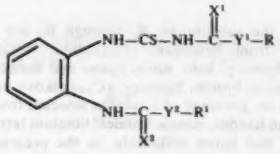
Filed May 13, 1971, Ser. No. 143,216

Claims priority, application France, May 15, 1970, 70.17838

Int. Cl.² C07C *155/02, 155/08*

U.S. Cl. 260—455 A **15 Claims**

1. Phenylthiourea derivatives of the general formula:



wherein R and R^1 represent alkyl of 1 through 4 carbon atoms, X^1 and Y^1 represent oxygen or sulphur, and X^2 and Y^2 represent oxygen or sulphur, at least one of X^2 and Y^2 representing sulphur.

3,985,783

PROCESS FOR RING ACYLATION OF PHENOLS

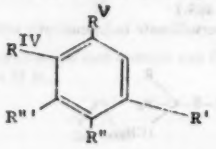
Francis Johnson, Long Island City, N.Y., and Renato Cricchio, Varese, Italy, assignors to The Dow Chemical Company, Midland, Mich.

Filed June 9, 1975, Ser. No. 585,229

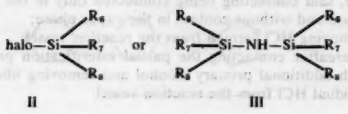
Int. Cl.² C07C *49/82, 69/95, 121/75*

U.S. Cl. 260—465 F **3 Claims**

1. An improved process for ring acylating a phenolic compound of the general formula

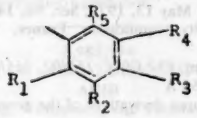


wherein R', R'', R''', R^{IV} and R^V are independently selected from the group consisting of hydrogen, hydroxy, (C_{1-3})-alkyl, (C_{1-3})-alkoxy and carbo-(C_{1-3})-alkoxy, with the proviso that at least one of R' and R''' is hydroxy; which comprises reacting a molar proportion of the above phenolic compound with a silylating agent selected from a compound of one of the following formulas



II III

wherein halo is chloro or bromo and each of the groups R_6, R_7 and R_8 independently represents (C_{1-4})-alkyl or phenyl, in a molar proportion at least corresponding to the number of the hydroxy groups of the phenolic compound, at room temperature, in the presence of an organic tertiary nitrogen base as acid acceptor when a silylating agent of formula II is employed, then acylating the so-obtained O-silyl derivative with a compound of the formula R-COY, wherein R is (C_{1-3})-alkyl or the group



wherein the substituents R_1 through R_5 are independently selected from hydrogen, (C_{1-3})-alkyl, (C_{1-3})-alkoxy, benzyloxy, hydroxy, halo, nitro, cyano and amino and Y represents chloro, bromo, hydroxy, (C_{1-3})-alkoxy or the —OCOR group in the presence of a catalyst selected from the group of aluminum halides, stannic halides, titanium tetrachloride, zinc chloride and boron trifluoride, in the presence of an inert organic solvent at a temperature varying from 0° C. to 100° C. for a period of time between about 5 minutes and about 48 hours.

3,985,784

THIOETHER SULFONATES FOR USE IN ELECTROPLATING BATHS

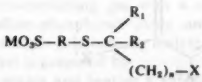
Richard John Clauss, Allen Park; Robert Arnold Tremmel, Woodhaven, and Donald Harvey Becking, West Bloomfield, all of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 270,352, July 10, 1972, abandoned, which is a division of Ser. No. 176,688, Aug. 31, 1971, Pat. No. 3,703,448, which is a continuation-in-part of Ser. No. 862,942, Oct. 1, 1969, abandoned. This application Mar. 7, 1975, Ser. No. 556,232

Int. Cl.² C07C *121/16, 121/20, 143/13*

U.S. Cl. 260—465.1 **7 Claims**

1. A thioethersulfonate independently selected from



wherein the following definitions delineate the scope of the above general formula:

M = Na, K, NH_4 or H;

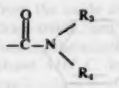
R = an alkylene group containing 2 to 4 carbon atoms;

R_1 = H, or alkyl group containing 1 to 4 carbon atoms;

R_2 = H, or $(CH_2)_m$ X;

m = 1 + 2

X = -CN, or



R_3, R_4 = H, or alkyl group containing 1 - 4 carbon atoms;

n = 0 to 3 with the proviso that when two X groups are present in the compound they are identical.

3,985,785

CYANOETHYL ACETAMIDINE COMPOUNDS

Albrecht Edenhofer, Basel, Switzerland; Hans Spiegelberg-Schoop, deceased, late of Basel, Switzerland; by Annemarie Spiegelberg, heiress, Binningen; by Anna Spiegelberg-Schoop, heiress, Basel, both of Switzerland, and Hans Spiegelberg-Von der Crone, heir, La Jolla, Calif., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

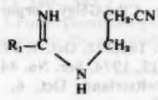
Filed Aug. 11, 1975, Ser. No. 603,843

Claims priority, application Switzerland, Aug. 19, 1974, 11310/74

Int. Cl.² C07C *121/42*

U.S. Cl. 260—465.5 R **4 Claims**

1. A compound of the formula:



IIa

wherein R_1 is lower alkyl having 1–6 carbon atoms.

3,985,786

PREPARATION OF UNSATURATED NITRILES

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 28, 1975, Ser. No. 599,735

Int. Cl.² C07C *120/00*

U.S. Cl. 260—465.8 R **20 Claims**

1. A process which comprises contacting at least one olefinic hydrocarbon reactant, at least one olefinically unsaturated mononitrile reactant and at least one monoadduct reaction product of an olefinic hydrocarbon compound and an olefinically unsaturated mononitrile compound, in the presence of an aqueous diluent, under reaction conditions suitable to produce at least one olefinically unsaturated dinitrile product, each of said olefinically unsaturated mononitrile reactant and said olefinically unsaturated mononitrile compound containing at least one hydrogen atom attached to a doubly bonded carbon atom and containing a cyano group attached to a carbon atom adjacent and doubly bonded to a carbon atom which is attached to at least one hydrogen atom, each of said olefinic hydrocarbon reactant and said olefinic hydrocarbon compound having at least one olefinic linkage having joined to one of the doubly bonded carbons a carbon atom having at least one hydrogen atom attached thereto, wherein during substantially the entire reaction period the concentration of said monoadduct reaction product in the resulting reaction mixture is within the range of about 10 to about 90 weight percent of the total reaction mixture.

3,985,787

4,5-CIS-DIDEHYDRO-PGA$_1$ ANALOGS

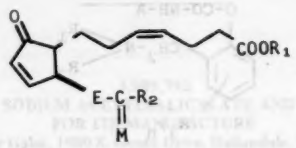
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 440,629, Feb. 7, 1974, Pat. No. 3,933,889, which is a continuation-in-part of Ser. No. 247,993, April 27, 1972, abandoned. This application Nov. 7, 1975, Ser. No. 629,883

Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—468 D 32 Claims

1. An optically active compound of the formula

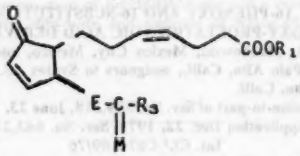


or a racemic compound of that formula and the mirror image thereof, wherein M is

or

wherein R_3 is hydrogen, methyl, or ethyl; wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_2 is alkyl of 2 to 4 carbon atoms, inclusive, substituted with zero to 2 fluoro, inclusive; and wherein E is trans-CH=CH- or $-CH_2CH_2-$; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

10. An optically active compound of the formula

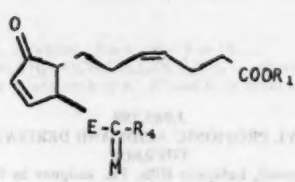


or a racemic compound of that formula and the mirror image thereof, wherein M is

or

wherein R_3 is hydrogen, methyl, or ethyl; wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_2 is alkyl of 2 to 4 carbon atoms, inclusive, substituted with zero to 2 fluoro, inclusive; and wherein E is trans—CH=CH— or $-CH_2CH_2-$; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

17. An optically active compound of the formula

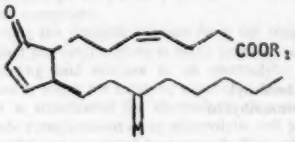


or a racemic compound of that formula and the mirror image thereof, wherein M is

or

wherein R_3 is hydrogen, methyl, or ethyl; wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; and wherein R_4 is alkyl of 6 to 10 carbon atoms, inclusive, substituted with zero to 2 fluoro, inclusive; and wherein E is trans—CH=CH— or $-CH_2CH_2-$; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

29. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein M is

or

wherein R_3 is hydrogen, methyl, or ethyl; and wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12

carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,985,788

PHENYL PROPIONIC ACIDS AND DERIVATIVES THEREOF

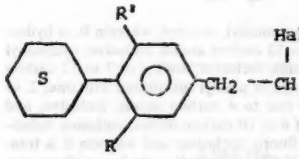
Julius Diamond, Lafayette Hills, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 164,822, July 21, 1971, abandoned. This application Oct. 4, 1973, Ser. No. 403,516

Int. Cl.² C07C *63/33, 69/76*

U.S. Cl. 260—469 **21 Claims**

1. A compound of the formula



where:

R is
- chloro,
- bromo,
- nitro,
- methylsulfonyl,
- trifluoromethyl or
- cyano;

R′ is
- hydrogen,
- chloro,
- bromo or
- nitro;

Hal is
- fluoro,
- chloro or
- bromo; and

Z is
- hydroxyl,
- lower alkoxy,
- phenyl lower alkoxy, or
- the group —OM in which M is a member of an alkali metal, alkaline earth metal, aluminum, ammonium, and di-lower alkyl ammonium.

3,985,789

CARBAMIC ACID ESTERS

Jürgen Hocker, Schildgen; Hans-Joachim Diehr, Wuppertal, and Rudolf Merten, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 22, 1974, Ser. No. 472,256

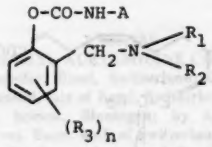
Claims priority, application Germany, May 22, 1973, 2325927

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07C *125/06*

U.S. Cl. 260—472 **2 Claims**

1. A compound of the general formula



wherein

n represents an integer of from 1 to 4,

A represents an aromatic hydrocarbon group obtained by removing the NCO group from a monomeric aromatic monoisocyanate containing 6–14 carbon atoms,

R_1 and R_2 may be the same or different and each represent a C_1-C_6 alkyl group, and

R_3 represents hydrogen, chlorine, bromine, or a C_1-C_{18} alkyl group.

3,985,790

PHENOXYALKANE CARBOXYLIC ACID DERIVATIVE

Gunter Metz, Blaubeuren, and Manfred Specker, Ehingen, Danube, both of Germany, assignors to Ludwig Merckle KG, Blaubeuren, Germany

Filed July 23, 1974, Ser. No. 491,052

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C07C *103/78*

U.S. Cl. 260—472 **1 Claim**

1. 4-(p-chlorophenoxyacetylamino)-benzoic acid diethylaminoethyl ester p-chlorophenoxyisobutyrate.

3,985,791

16-PHENOXY AND 16-SUBSTITUTED PHENOXY-PROSTATRIENOIC ACID DERIVATIVES

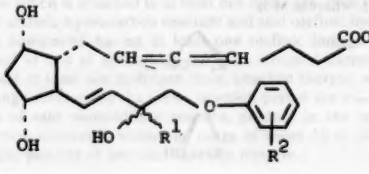
Joseph M. Muchowski, Mexico City, Mexico, and John H. Fried, Palo Alto, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 589,218, June 23, 1975. This application Dec. 22, 1975, Ser. No. 643,219

Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 A **48 Claims**

1. A racemic or 8R-antimeric compound selected from the group of those represented by the following formula:



wherein R is hydrogen, a lower alkyl group of 1 to 4 carbon atoms, or the pharmaceutically acceptable, non-toxic salts of compounds in which R is hydrogen;
R^1 is hydrogen, methyl or ethyl;
R^2 is hydrogen, o-, m-, or p-halo (fluoro, chloro or bromo), o-, m- or p-trifluoromethyl, o-, m- or p-lower alkyl or o-, m- or p-lower alkoxy, and the wavy lines ( ) indicate the α or β configuration or mixtures thereof, provided that when R^1 is α, the hydroxyl group, attached to the same carbon atom as R^1 is β and when R^1 is β, the hydroxyl group, attached to the same carbon atom as R^1 is α.

3,985,792

STABLE SODIUM ACETYLSALICYLATE AND METHOD FOR ITS MANUFACTURE

Alexander Galat, 1980 S. Ocean Drive, Hallandale, Fla. 33009

Continuation-in-part of Ser. No. 211,214, Dec. 23, 1971, abandoned. This application Nov. 30, 1973, Ser. No. 420,381

Int. Cl.² C07C *69/14*

U.S. Cl. 260—480 **4 Claims**

1. A process for the production of anhydrous sodium aspirin in the form of plate-like crystals which comprises forming a concentrated aqueous solution of sodium aspirin containing about 1 to 2.5 parts by weight of sodium aspirin for each part by weight of water, gradually and thoroughly admixing with said solution a water miscible organic solvent selected from the 3 and 4-carbon saturated aliphatic alcohols and mixtures thereof in the proportion of about 5 to 10 parts by weight of solvent for each part by weight of sodium aspirin as the sole precipitating agent to precipitate hydrated plate-like crystals of sodium aspirin dihydrate while maintaining the temperature during precipitation between about −10° C and +10° C, separating said dihydrate, and removing the water of hydration to obtain substantially pure anhydrous sodium aspirin.

4. Pure stable anhydrous sodium aspirin in the form of plate-like crystals produced by precipitation of plate-like crystals of sodium aspirin dihydrate from a concentrated aqueous solution of sodium aspirin containing about 1 to 2.5 parts by weight of sodium aspirin for each part by weight of water by the gradual and thorough admixing therewith of a water miscible organic solvent selected from the 3 and 4-carbon saturated aliphatic alcohols and mixtures thereof in the proportion of about 5 to 10 parts by weight for each part by weight of sodium aspirin while maintaining the temperature during precipitation, between about −10° C to +10° C, followed by separation of precipitated plate-like crystals of sodium aspirin dihydrate and removal of water of hydration therefrom.

3,985,793

NITROGEN-CONTAINING COMPOUNDS

John Langshaw Brooks; Richard Budziarek; James William Crook, and Edward Jervis Vickers, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

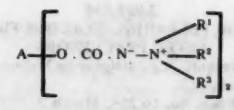
Filed Nov. 18, 1974, Ser. No. 524,948

Claims priority, application United Kingdom, Nov. 30, 1973, 55659/73

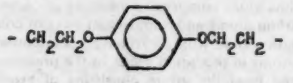
Int. Cl.² C01C *125/04*

U.S. Cl. 260—482 B **2 Claims**

1. A compound of the formula



wherein A is a divalent radical selected from the class consisting of



$-(CH_2)_x-$ where x has a value 4 to 10
and $-CH_2CH_2-(OCH_2CH_2)_mOCH_2CH_2-$ where m has the value 0 or 1 and each of R^1, R^2 and R^3 is lower alkyl.

3,985,794

PROCESS FOR THE PRODUCTION OF VINYL ACETATE FROM ETHYLENE

Benedetto Calcagno, Milan; Claudio Divo, Saronno (Varese), and Marcello Ghirga, Bresso (Milan), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Oct. 1, 1969, Ser. No. 862,914

Claims priority, application Italy, Oct. 12, 1968, 22416/68

The portion of the term of this patent subsequent to Mar. 23, 1993, has been disclaimed.

Int. Cl.² C07C *67/05*

U.S. Cl. 260—497 A **6 Claims**

1. In the process for the production of vinyl acetate from ethylene, which comprises uniting ethylene and oxygen or oxygen-containing gases in the presence of a catalytic mixture consisting essentially of palladium and copper halogenides and an acetate being a member selected from the group consisting of alkali metal and alkaline earth metal acetates in acetic acid, at high temperature and pressure, the improvement which comprises:

a. removing the catalytic mixture from the reaction vessel in which the vinyl acetate is being produced,
b. subjecting said mixture to an electrolytic deposition process in which the catalytic mixture removed from said vessel is transferred for electrolytic deposition to the cathode compartment of an electrolytic cell in which the electrodes are separated by porous baffles, while a dilute acid solution is introduced into the anode compartment, said palladium and copper being recovered substantially in their elementary form,
c. said metallic palladium and copper being placed in suspension in a dilute aqueous solution of hydrochloric acid and converted into their respective chloride salts by bubbling a member selected from the group consisting of chloride gas, air, and oxygen gas into said suspension, and
d. feeding the thus formed palladium and copper chloride salts back to the reaction vessel in which the vinyl acetate is being produced,

said electrolytic deposition being carried out at a cathode current density ranging from 0.1 to 10.0 A./sq.dm., and the temperature during the electrolytic deposition ranging from 60° to 90° C.

3,985,795

PROCESS FOR PREPARING GLYCOLS FROM THEIR ESTER PRECURSORS

John Kollar, Wyckoff, N.J., assignor to Halcon International, Inc., New York, N.Y.

Continuation of Ser. No. 16,259, March 3, 1970, abandoned. This application Dec. 30, 1974, Ser. No. 537,298

Int. Cl.² C07D 67/05, 29/00

U.S. Cl. 260—497 R 10 Claims

1. In a process for preparing vicinal glycol mono- and diesters of olefins which comprises contacting an olefin containing 2 to 30 carbon atoms and a molecular oxygen containing gas in an oxidation zone with a carboxylic acid containding 2 to 6 carbon atoms in the liquid phase in the presence of a halogen selected from the group consisting of bromine, and a bromine-containing compound capable of producing bromide ions in solution in the oxidation zone, and a variable metal cation selected from the group consisting of tellurium, cerium, antimony, manganese, vanadium, gallium, arsenic, cobalt, copper, selenium, chromium and silver, and a liquid effluent is continuously removed from said oxidation zone, the improvement which comprises separating from said effluent a residue having a higher boiling point than said mono- and diesters, and contacting said residue with water to produce additional vicinal glycol of said olefin.

3,985,796

HYDROXYLATION OF AROMATIC COMPOUNDS

Stephen N. Massie, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 491,008, July 23, 1974, Pat. No. 3,931,295. This application Oct. 1, 1975, Ser. No. 618,540

Int. Cl.² C07F 9/38, 143/64, 143/44; C07C 65/04

U.S. Cl. 260—502.4 R 9 Claims

1. A process for the nuclear hydroxylation of an aromatic compound having the formula:

$$R_mArX_nH$$

in which Ar is a monocyclic or polycyclic hydrocarbon nucleus, R is selected from the group consisting of carboxylic, sulfonic, phosphonic acid groups, alkali metal or alkaline earth metal salts of the acids, X is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, alkoxy, aralkyl, alkaryl, halogen, hydroxy and amino substituents, *m* is an integer of from 1 to about 5 and *n* is an integer of from 0 to 5, which comprises reacting said aromatic compound with hydrogen peroxide at a temperature in the ranger of from about −10°C to about 150° C., a pressure in the range of from about atmospheric to about 100 atmospheres and a mole ratio of from about 1:1 to about 1:10 moles of hydrogen peroxide per mole of aromatic compound in the presence of a catalyst comprising an alkaline solution containing an aliphatic nitrile compound, and recovering the resultant hydroxylated aromatic compound.

3,985,797

HYDROXYLATION OF AROMATIC COMPOUNDS

Stephen N. Massie, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 491,008, July 23, 1971, Pat. No. 3,931,295. This application Oct. 1, 1975, Ser. No. 618,539

Int. Cl.² C07F 9/38, 143/64, 143/44; C07C 65/04

U.S. Cl. 260—502.4 R 9 Claims

1. A process for the nuclear hydroxylation of an aromatic compound having the formula:

$$R_mArX_nH$$

in which Ar is a monocyclic or polycyclic hydrocarbon nucleus, R is selected from the group consisting of carboxylic, sulfonic, phosphonic acid groups, alkali metal or alkaline earth metal salts of the acids, X is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, alkoxy, aralkyl, alkaryl, hydroxy, halogen and amino substituents, *m* is an integer of from 1 to about 5 and *n* is an integer of from 0 to 5, which comprises reacting said aromatic compound with hydrogen peroxide at a temperature in the range of from about −10° C to about 150° C., a pressure in the range of from about atmospheric to about 100 atmospheres and a mole ratio of from about 1:1 to about 1:10 moles of hydrogen peroxide per mole of aromatic compound in the presence of a catalyst comprising an alkaline solution containing a salt of hydrocyanic acid, and recovering the resultant hydroxylated aromatic compound.

3,985,798

11α-HOMO-PROSTANOIC ACIDS AND ESTERS

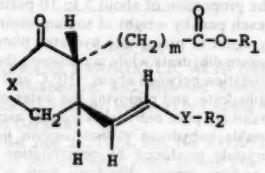
Middleton Brawner Floyd, Jr., Suffern, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 27, 1975, Ser. No. 544,745

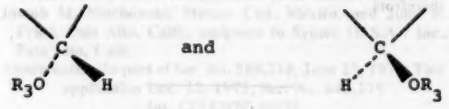
Int. Cl.² C07C 61/38, 69/74

U.S. Cl. 260—514 D 13 Claims

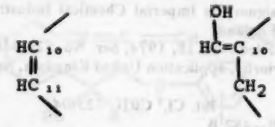
1. An optically active compound of the formula:



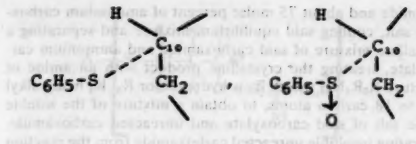
or a racemic compound of that formula and the mirror image thereof wherein m is an integer from 5 to 8, inclusive; R_1 is selected from the group consisting of hydrogen and alkyl of one to twelve carbon atoms; R_2 is alkyl of four to seven carbon atoms; Y is a divalent moiety selected from the group consisting of:



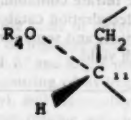
wherein R_3 is selected from the group consisting of hydrogen and triphenylmethyl; and X is a divalent moiety selected from the group consisting of:



and tautomers thereof.



and



wherein R_4 is selected from the group consisting of hydrogen and alkyl of one to three carbon atoms; and the pharmacologically acceptable cationic salts thereof when R_1 is hydrogen.

3,985,799

2-FLUORO-6-TRIFLUOROMETHYLBENZOIC ACID

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 107,455, Jan. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 95,405, Dec. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 12,864, Feb. 19, 1970, abandoned, which is a continuation-in-part of Ser. No. 884,011, Dec. 10, 1969, abandoned. This application Aug. 20, 1973, Ser. No. 390,031

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07C *63/12*

U.S. Cl. 260—515 A **1 Claim**

1. The compound which is 2-fluoro-6-trifluoromethyl benzoic acid.

3,985,800

PROCESS FOR THE MANUFACTURE OF ACRYLIC ACID

Heinz Erpenbach, Surth; Klaus Gehrmann, Hurth-Knapsack; Winfried Lork, Erftsdadt Friesheim, and Peter Prinz, Hurth-Burbach, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt/Main, Germany

Filed Aug. 31, 1973, Ser. No. 393,347

Claims priority, application Germany, Sept. 5, 1972, 2243584

Int. Cl. C07c *57/04, 51/26*

U.S. Cl. 260—530 N **5 Claims**

1. In a process for making acrylic acid by reacting acrolein with molecular oxygen in the presence of steam and, if desired, one or more inert gases, at elevated temperatures and in contact with a fixed bed cobalt molybdate catalyst, which has been prepared by precipitating cobalt molybdate from the combined aqueous solutions of a cobalt salt, of a molybdenum compound and of ammonia at a temperature of about 60°C and at a pH of at most 7; filtering off, washing and drying the resulting precipitate at a temperature of at least 100°C; heating the dry cobalt molybdate for several hours at elevated temperatures, grinding and transforming it into shapes and sintering the cobalt molybdate shapes for several hours, the improvement which comprises producing the acrylic acid in contact with a catalyst prepared by a process consisting essentially of combining an aqueous solution of the cobalt salt with that of the molybdenum compound in the atomic ratio of Co:Mo of about 1.05:1; establishing in the combined solutions a pH between 3.8 and 6.0; drying the precipitate at 110°–170°C; heating the dry cobalt molybdate over a period of 12 to 20 hours to temperatures between 250° and 550°C; and sintering the cobalt molybdate shapes over a period of 6 to 10 hours at temperatures between 500° and 700°C with the resultant formation of a cobalt molybdate catalyst having an inner surface area between 4 and 8 square meters/g and a volume of pores between 0.1 and 9.2 milliliters/g.

3,985,801

PROCESS FOR RECOVERING GLYCINE FROM SODIUM CHLORIDE SOLUTIONS

Jon Carl Thunberg, Amherst, N.H.; Robert Wright Bragdon, Marblehead, Mass., and William Philip Moore, Hudson, N.H., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 517,469, Oct. 24, 1974, Pat. No. 3,904,585, which is a continuation-in-part of Ser. No. 442,543, Feb. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 319,539, Dec. 29, 1972, Pat. No. 3,808,269. This application Apr. 29, 1975, Ser. No. 572,860

Int. Cl.² C07C *99/12*

U.S. Cl. 260—534 R **6 Claims**

1. A process for recovering glycine from an aqueous starting solution consisting essentially of water, glycine, and sodium chloride, the aqueous starting solution having a temperature above 0° C, a pH of 4.5–8.5, a mole ratio of glycine to sodium chloride of 0.7–5:1, the process comprising:

a. forming a first slurry consisting essentially of a first lot of precipitated glycine and a first mother liquor consisting essentially of water, dissolved glycine, and dissolved sodium chloride by cooling the aqueous starting solution to a temperature effective for precipitating glycine;

b. separating the first mother liquor from the first lot of precipitated glycine, and recovering the separated solid glycine;

c. forming a second slurry consisting essentially of a first lot of precipitated sodium chloride and a second mother liquor consisting essentially of water, dissolved glycine, and dissolved sodium chloride by evaporating water from the first mother liquor;

d. separating the second mother liquor from the first lot of precipitated sodium chloride while maintaining the temperature of the second slurry at a temperature effective for preventing the precipitation of glycine;

e. forming a third slurry consisting essentially of a second lot of precipitated glycine and a third mother liquor consisting essentially of water, dissolved glycine, and dissolved sodium chloride by admixing the separated second mother liquor with a second lot of the aqueous starting solution and cooling the resulting admixture to a temperature effective for causing the second lot of glycine to precipitate;

f. separating the third mother liquor from the second lot of precipitated solid glycine and recovering the separated solid glycine;

g. forming a fourth slurry consisting essentially of a second lot of precipitated sodium chloride and a fourth mother liquor consisting essentially of water, dissolved glycine, and dissolved sodium chloride by evaporating water from the third mother liquor; and

h. separating the fourth mother liquor from the second lot of precipitated sodium chloride while maintaining the temperature of the fourth slurry at a temperature effective for preventing the precipitation of solid glycine.

3,985,802

LUBRICATING OILS CONTAINING HIGH MOLECULAR WEIGHT MANNICH CONDENSATION PRODUCTS

Edmund J. Piasek, Chicago, Ill., and Robert E. Karll, Munster, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 284,222, Aug. 28, 1972, abandoned, which is a division of Ser. No. 798,102, Feb. 10, 1969, Pat. No. 3,798,165, which is a continuation-in-part of Ser. No. 502,368, Oct. 22, 1965, Pat. No. 3,539,633. This application Oct. 8, 1974, Ser. No. 513,108

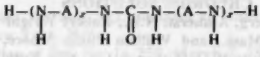
Int. Cl.² C07C *127/17, 157/07*

U.S. Cl. 260—553 A **3 Claims**

1. An oil-soluble high molecular weight Mannich product from the condensation of reactants:

1. a high molecular weight alkyl-substituted phenol wherein said alkyl-substituent has an average number of carbon atoms of from 50 to 20,000 carbon atoms;

2. an amine havng the formula:



wherein x is an integer from 1 to 10 and A is a divalent saturated hydrocarbon group having 2 to 3 carbon atoms; and

3. a formaldehyde affording reactant wherein the respective reactant molar ratio is 1.0:0.7–1.0:1.5–2.1 prepared by combining reactants (1) and (2), adding thereto reactant (3) and heating the resulting mixture to a temperature in the range of 100°–350° F under conditions which remove by-product water.

3,985,803

2-HALOADAMANTYL-(1)-ACETAMIDES

Yoshiaki Inamoto; Hirokazu Nakayama, and Naotake Takaishi, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

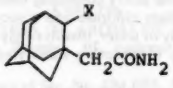
Filed June 26, 1974, Ser. No. 483,105

Claims priority, application Japan, June 29, 1973, 48-73368

Int. Cl.² C07C *103/19*

U.S. Cl. 260—557 B **1 Claim**

1. A compound of the formula



wherein X is chloro, bromo or iodo.

3,985,804

AGRICULTURAL SUBSTITUTED 2-METHYLBENZANILIDE GERMICIDE

Isao Chiyomaru, Shimizu; Seigo Kawada, Fujieda, and Kiyoshi Takita, Shimizu, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

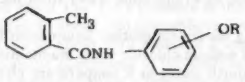
Division of Ser. No. 489,412, July 17, 1974, Pat. No. 3,937,840. This application Aug. 15, 1975, Ser. No. 605,050

Claims priority, application Japan, Aug. 18, 1973, 48-92702

Int. Cl.² C07C *103/78*

U.S. Cl. 260—558 P **3 Claims**

1. 2-Methylbenzanilide compounds having the formula



wherein R represents C_{1-12} alkyl C_{1-12}, alkenyl, alkynyl C_{1-12}, benzyl or monochlorobenzyl.

3,985,805

PREPARATION OF ALKYLCARBOXAMIDES

Richard V. Norton, Wilmington, Del., assignor to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 409,484, Oct. 25, 1973, abandoned. This application Oct. 1, 1975, Ser. No. 618,657

Int. Cl.² C07C *102/08, 103/76*

U.S. Cl. 260—558 R **7 Claims**

1. A process for the preparation of an N-alkylcarboxamide from a nitrile which consists of subjecting a nitrile of structure R_1—CN or R_2—$(CN)_n$ where R_1 is alkyl of 1 to 18 carbon and R_2 is an aromatic hydrocarbon containing from 6 to 12 carbon atoms and n is a small integer of 1, 2, or 3 to an aqueous non-catalytic hydrolysis at a temperature of from about 200° to about 350° C. to obtain from said nitrile, an equilibrium mixture consisting essentially of about 25 molar percent carboxamide and about 75 molar percent of ammonium carboxylate salt, cooling said equilibrium mixture and separating a crystalline mixture of said carboxamide and ammonium carboxylate, treating the crystalline product with an amine of structure R_3R_4NH where R_3 is hydrogen or R_4, R_4 being alkyl of 1 to 18 carbon atoms, to obtain a mixture of the soluble amine salt of said carboxylate and unreacted carboxamide, separating insoluble unreacted carboxamide from the reaction mass, contacting the filtrate containing the amine salt of said carboxylate with a dehydration catalyst to effect dehydration to an alkylcarboxamide, and separating said N-alkylcarboxamide product in high yield.

3,985,806

PROCESS FOR CONTINUOUSLY MANUFACTURING ACRYLAMIDE

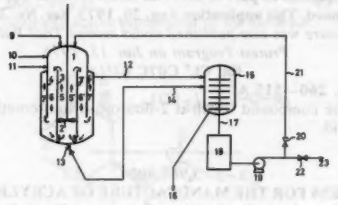
Nobuyoshi Hashimoto, Yokohama; Kiyotaka Yoshimura, Mobara; Shiro Asano; Tadatoshi Honda, both of Yokohama, and Ryozi Tsuchiya, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Aug. 10, 1972, Ser. No. 279,309

Claims priority, application Japan, Aug. 19, 1971, 46-62558

Int. Cl.² C07C *103/133*

U.S. Cl. 260—561 N **7 Claims**



1. A process for continuously manufacturing acrylamide by hydrating acrylonitrile in the presence of a free metallic copper catalyst, which process comprises: continuously supplying reaction materials acrylonitrile, water and supplementary catalyst into a catalyst slurry circulating section of a reactor and reacting said materials under agitation; passing said reaction material into a catalyst precipitating section in said reactor and in substantial communication with said catalyst slurry circulating section and substantially stopping the fluid flow therein to separate the reaction materials into reaction liquid and catalyst slurry; cotinuously removing said reaction liquid from which a major portion of catalyst has been separated from said catalyst precipitating section; and simultaneously removing a portion of catalyst slurry from the catalyst slurry circulating section.

3,985,807

ALKOXY DERIVATIVES OF HYDROXY AMINIMIDES

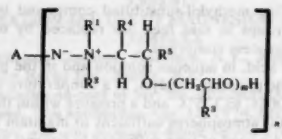
Robert A. Grimm, Upper Arlington; Owen Portwood, Columbus; Edward A. Sedor, Worthington, and Jeannene A. Williams, Columbus, all of, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 31, 1975, Ser. No. 563,943

Int. Cl.² C07C *103/30, 103/32, 103/56*

U.S. Cl. 260—561 B **6 Claims**

1. A compound having the formula:



wherein:

R^1 and R^2 represent the same or different alkyl, cycloalkyl or aralkyl radicals or together represent the single divalent organic radical; R^4 and R^5 are independently selected from the group consisting of hydrogen, alkyl, cyloalkyl, aryl, aralkyl, alkaryl, and alkoxyalkyl;

A is a carboxylic acid residue attached to the indicated nitrogen atom by the carbonyl group of the acid;

R^3 = alkyl, alkoxyalkyl or hydrogen;

n is an integer of from 1 to 5; and

m = 1 - 15

3,985,808
PROCESS FOR THE PREPARATION OF SELECTIVELY HALOGENATED KETONES AND KETALS

Eddie N. Gutierrez, Fort Lee, and Robert C. Reardon, Jr., Tenafly, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

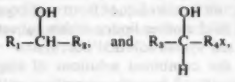
Division of Ser. No. 426,771, Dec. 20, 1973, Pat. No. 3,944,568. This application Oct. 30, 1975, Ser. No. 627,162

Int. Cl.² C07C *41/10, 45/00*

U.S. Cl. 260—586 R **11 Claims**

1. A method for preparing selectively halogenated ketones comprising:

a. preparing selectively halogenated ketals, by reacting a secondary alcohol or halohydrin compound, of the general formula



with chlorine or bromine, wherein x is chlorine or bromine, in the presence of an alcohol selected from the group consisting of

i. monohydric and polyhydric alcohols having 1 to 5 carbon atoms wherein, further, each C—H group of said monohydric and polyhydric alcohols has a hydroxyl group attached thereto,

ii. ethanol,

iii. 2,3 butanediol, and

iv. propylene glycol,

wherein the ratio of said alcohol to said secondary alcohol or halohydrin is from about 5:1 to about 20:1, wherein said reaction is carried out at a temperature of from about 0°C to about 80°C, and wherein R_1, R_2, R_3 and R_4 are independently selected from the group consisting of

i. straight chain alkyl groups of from 1 to 20 carbon atoms,

ii. alkylaryl groups wherein the alkyl moiety is a straight chain alkyl group of from 1 to 20 carbon atoms,

iii. branched chain alkyl groups of from 3 to 20 carbon atoms provided that when either R_1 or R_2 of the pair R_1 and R_2, or R_3 or R_4 of the pair R_3 and R_4 is a branched chain, the other member is a straight chain alkyl group as previously defined, and

iv. a phenyl group, provided that when either R_1 or R_2 of the pair R_1 and R_2, or R_3 or R_4 of the pair R_3 and R_4 is phenyl, the other member is a straight chain alkyl group as previously defined,

or wherein R_1 and R_2 or R_3 and R_4 may be taken together to form a cyclo alkyl ring having at least six carbon atoms in said ring; and

b. subsequently hydrolyzing said selectively halogenated ketals under acid conditions.

3,985,809
PRODUCTION OF ANISALDEHYDE

Donald Harvey Becking, Birmingham, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Continuation of Ser. No. 384,778, Aug. 1, 1973, abandoned. This application Jan. 15, 1975, Ser. No. 541,295

Int. Cl.² C07C *45/00*

U.S. Cl. 260—600 R **2 Claims**

1. A method of producing anisaldehyde, which comprises introducing a manganic alum wherein the manganate ion has a plus 3 valence and is obtained by oxidizing in an electrolytic cell a mixture of manganese sulfate, potassium or sodium sulfate and sulfuric acid, into a reaction chamber containing approximately 8% by weight of sulfuric acid; adding to the chamber p-methoxytoluene; and while the oxidation proceeds, controlling the acid concentration to between about 2½ to 8½% by weight of sulfuric acid, the temperature within the reaction chamber to not substantially exceed more than about 30° C., and the ratio of para-methoxytoluene to anisaldehyde to between approximately 3 : 1 and not less than about 2 : 1, whereby anisaldehyde of relatively high purity is obtained with a consequent minimum level of tars and anisic acid.

3,985,810
PROCESS FOR PREPARING PERFLUORINATED ETHERS

Sigmar-Peter von Halasz, Kelkheim, Taunus, and Friedhelm Kluge, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

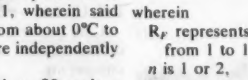
Filed Oct. 28, 1975, Ser. No. 626,349

Claims priority, application Germany, Oct. 30, 1974, 2451493

Int. Cl.² C07C *41/00*

U.S. Cl. 260—615 F **10 Claims**

1. Process for preparing perfluorinated ethers of the formula



(I)

wherein

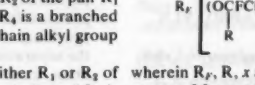
R_F represents the radical of a perfluoroalkane having of from 1 to 19 carbon atoms and n free valencies,

n is 1 or 2,

R represents the groups CF_3 or F and

x is an integer of from 0 to 50,

which comprises reacting a carboxylic acid fluoride of the formula



(II)

wherein R_F, R, x and n have the aforesaid meaning, at temperatures of from +50° to +350° C in the presence of a metallic catalyst comprising at least one metal selected from the group consisting of magnesium, tin, lead, bismuth, cerium, lanthanum, titanium, zirconium, chromium and manganese or at least one metal selected from groups IB, IIB or VIII of the Periodic Table, with elementary fluorine.

3,985,811

5-CHLORO-2-HYDROXYMETHYL BENZHYDROL

Luigi Fontanella, and Luigi Mariani, both of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed May 23, 1973, Ser. No. 363,226
Int. Cl.² C07C 33/02
U.S. Cl. 260—618 B 1 Claim

1. The compound 5-chloro-2-hydroxymethyl-benzhydrol.

3,985,812

CAUSTIC REFINING OF 2,3,6-TRIMETHYLPHENOL

Elsio Del Bel, Bethel Park; Donald C. Jones, and Martin B. Neuworth, both of Pittsburgh, all of Pa., assignors to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 764,429, Oct. 2, 1968, abandoned. This application Nov. 14, 1974, Ser. No. 523,626
Int. Cl.² C07C 37/38, 37/44
U.S. Cl. 260—621 B 3 Claims

1. In a process for distillatively recovering 2,3,6-trimethylphenol from a methylate product obtained by the methylation of phenol with methanol over activated alumina wherein the methylate product is subjected to a first fractionation to produce a first fraction containing at least 40 weight percent 2,3,6-trimethylphenol followed by subjecting said first fraction to a second fractionation to produce a high purity 2,3,6-trimethylphenol, the improvement therein of increasing the yield of the high purity 2,3,6-trimethylphenol by, prior to said second fractionation, subjecting said first fraction to sequential dissolution in a hydrocarbon solvent boiling in the range of 60° to 150° C and countercurrent extraction with an aqueous solution of an alkali metal hydroxide in an extraction zone, the concentration of alkali metal hydroxide in said aqueous solution as fed to the extraction zone being in the range of 2 and 10 weight percent and the ratio of moles of alkali metal hydroxide in said aqueous solution as fed to the extraction zone to moles of extractables being in the range of 0.9 to 2.0, said extraction being carried out under temperature conditions sufficient to assure retention of the 2,3,6-trimethylphenol in the solvent phase while in the extraction zone, and recovering the raffinate as the feed stream for said second fractionation.

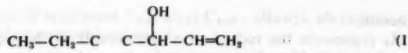
3,985,813

UNSATURATED ALCOHOLS

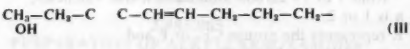
Jeffery N. Labovitz, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 526,496, Nov. 25, 1974. This application Sept. 12, 1975, Ser. No. 612,880
Int. Cl.² C07C 33/04
U.S. Cl. 260—632 Y 6 Claims

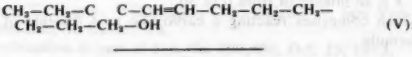
1. A compound selected from the formulas:



(I)



(III)



(V).

3,985,814

PRODUCTION OF ALCOHOLS FROM CARBOXYLIC ACIDS

Edward F. Dougherty, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Feb. 28, 1975, Ser. No. 554,251
Int. Cl.² C07C 29/00
U.S. Cl. 260—635 D 7 Claims

1. A process for converting a feed comprising an acyclic monocarboxylic acid having 2 to 7 carbon atoms or a dicarboxylic acid having 3 to 7 carbon atoms or mixture thereof to the corresponding methylol-substituted compound in which the carboxyl groups in said feed are replaced by methylol groups, which process comprises:

reacting said acid, in aqueous solution and in the presence of a metallic platinum catalyst, at a temperature with the range of 100° C to 325° C and a pressure within the range of 70 to 700 atmospheres sufficient to maintain a liquid phase, for a period of time sufficient to convert at least a portion of said the carboxyl groups in said feed to methylol groups,

said acid being free of substituents other than hydroxyl.

3,985,815

AQUEOUS CRYSTALLIZATION OF XYLITOL

Gerald Myer Jaffe, Verona, and Peter Hans Weinert, Wayne, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 296,404, Oct. 10, 1972, abandoned. This application Oct. 31, 1974, Ser. No. 519,446
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976
Int. Cl.² C07C 27/26, 29/24
U.S. Cl. 260—637 R 3 Claims

1. In a process for obtaining crystalline xylitol substantially free of xylose from a mixture consisting essentially of about 30% xylitol, about 0.3% to about 0.5% xylose and water; said mixture being obtained by hydrogenating an aqueous xylose solution;

wherein the improvement comprises:

a. concentrating said mixture by heating at a temperature of about 30°C. to about 50°C. under reduced pressure to provide an aqueous solution consisting essentially of about 60% to about 75% xylitol, from about 1% to less than about 5% xylose, and water;

b. fractionally crystallizing xylitol from said aqueous solution by cooling to a temperature below 15°C.;

c. separating the crystallized xylitol from said solution;

d. recovering the mother liquor from said crystallization and combining said mother liquor with a subsequent aqueous hydrogenated xylose solution batch; and

e. recycling the combined solutions of step (d) through steps (a) to (d) to provide crystalline xylitol containing no more than 0.05% xylose.

3,985,816

SEPARATION OF 1,1-DICHLOROETHANE FROM 1,2-DICHLOROETHANE

Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Division of Ser. No. 498,083, Aug. 16, 1974, Pat. No. 3,917,727. This application Apr. 4, 1975, Ser. No. 565,204
Int. Cl.² C07C 17/38, 17/02
U.S. Cl. 260—652 P 4 Claims

1. A process for separating 1,1-dichloroethane and 1,2-dichloroethane from a feed comprising a mixture thereof, comprising:

introducing said feed into a fractionation zone operated at temperatures and pressures to separate 1,1-dichloroethane, as overhead, from 1,2-dichloroethane; said fractionation zone being operated at an overhead temperature from about 170° F to about 310° F, a bottoms temperature from about 350° F to about 360° F and a column pressure from about 2 atm to about 10 atm (absolute); providing at least a portion of the heat requirements for the separation by introducing and reacting in the fractionation zone ethylene and chlorine to produce 1,2-dichloroethane; recovering separated 1,1-dichloroethane in a first stream as overhead withdrawn from said fractionation zone; and recovering separated 1,2-dichloroethane introduced as feed and produced from the chlorination of ethylene in a second stream withdrawn from said fractionation zone.

3,985,817

PREPARATION AND USE OF MAGNESIUM ACETYLENE COMPLEX

John Nicholson Gardner, Garrison, N.Y., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 402,544, Oct. 1, 1973, abandoned. This application Apr. 15, 1974, Ser. No. 460,846

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07F *3/02*

U.S. Cl. 260—665 R **3 Claims**

1. A process of producing a magnesium acetylene complex comprising reacting in liquid ammonia, magnesium and acetylene gas wherein the reaction medium contains from about 5 to 97% by weight of sodium in the form of sodium metal or combined with ammonia as sodamide, based upon the weight of sodium and magnesium in the reaction medium, said reaction taking place at a temperature of from −100°C. to +100°C. and a pressure of from about 15 psia to 1000 psia.

3,985,818

METHOD FOR THE PREPARATION OF UNSATURATED DIMERS OF α-METHYLSTYRENES

Satoshi Numata; Tsutomu Takase; Yoshio Morimoto, all of Nagoya, and Toshio Itakura, Okazaki, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

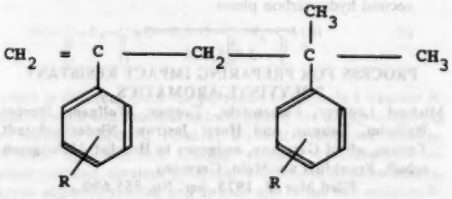
Filed Nov. 1, 1974, Ser. No. 520,151

Claims priority, application Japan, Nov. 9, 1973, 48-125443

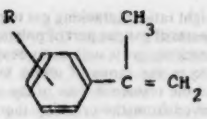
Int. Cl.² C07C *15/12*

U.S. Cl. 260—669 P **10 Claims**

1. A method for the preparation of 2,4-diphenyl-4-methyl-1-pentenes having the general formula



wherein R is hydrogen or alkyl having from 1 to 4 carbon atoms which comprises reacting α-methylstyrene having the general formula



wherein R is the same as above at a temperature of from 20° to 100° C. in the presence of a sulfonic acid type cation-exchange resin catalyst and in the further presence of a primary or secondary monohydric alkanol which contains from 2 to 5 carbon atoms.

3,985,819

PROCESS FOR PRODUCING ALKYLNAPHTHALENES

Katsumi Kobayashi, Minoo; Iwao Dohgane, Nishinomiya; Hiromichi Okabe, Ibaraki, and Kenji Tanimoto, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 8, 1974, Ser. No. 513,188

Claims priority, application Japan, Oct. 9, 1973, 48-113711; Oct. 9, 1973, 48-113712

Int. Cl.² C07C *3/56, 15/24*

U.S. Cl. 260—671 R **6 Claims**

1. A process for producing alkylnaphthalenes by alkylating naphthalene with an olefin having 2 to 4 carbon atoms, which comprises (1) introducing said olefin at a temperature of about 50° to 150° C for about 10 to 60 minutes into a solution of crude naphthalene containing thianaphthene as an impurity in an amount up to about 4.5% in a solvent selected from the group consisting of n-hexane, cyclohexane, n-heptane, iso-heptane, n-octane, iso-octane and n-nonane and having a boiling point sufficiently different from the boiling point of naphthalene and alkylnaphthalenes produced that the solvent is separable by distillation in the presence of (i) an aluminum chloride complex consisting of (a) aluminum chloride, (b) hydrogen chloride and (c) an alkylated benzene or naphthalene, or (ii) a solid aluminum chloride which is dissolved into the reaction solution by adding gaseous hydrogen chloride simultaneously with or prior to the introducing of said olefin, (2) aging the reaction solution at a temperature of about 80° to 120° C for about 1 to 3 hours, and (3) recovering the resulting alkylnaphthalenes, whereby alkylnaphthalenes containing as monoalkylnaphthalenes, a predominant amount of a β-monoalkylnaphthalene as compared to total monoalkylnaphthalene produced, are obtained, the amount of hydrogen chloride being used in said catalyst being at least an equimolar amount per the amount of aluminum chloride used, the amount of the aluminum chloride complex (i) or the amount of the solid aluminum chloride (ii) converted to an aluminum chloride basis is about 1.0 to about 5.0% on a molar basis on the naphthalene feed.

3,985,820

CRACKING PROCESS

Charles W. Albright, and George E. Keller, II, both of South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. Nos. 359,675, May 14, 1973, abandoned, and Ser. No. 359,676, May 14, 1973, Pat. No. 3,849,075, which is a continuation-in-part of Ser. No. 252,511, May 8, 1972, abandoned, and Ser. No. 252,512, May 8, 1972, abandoned. This application Aug. 20, 1974, Ser. No. 498,990

Int. Cl.² C07C *3/28*

U.S. Cl. 260—683 R **20 Claims**

1. A process for cracking polyethylene or polypropylene to monomer comprising the following steps:

a. converting the polymer into a fluidized particulate state;

b. introducing to a reaction zone a cracking gas comprising steam and the polymer from step (a) and admixing said polymer with the cracking gas in said reaction zone

wherein the weight ratio of cracking gas to polymer is about 1 to about 8 parts of gas per part of polymer, the temperature of the cracking gas is such as to heat the polymer to a temperature in the range of about 800° C. to about 1050° C., and the residence time of the polymer and the products derived from the cracking thereof in the reaction zone is about 10 to about 100 milliseconds; and

c. quenching effluent from the reaction zone and recovering the monomer.

9. A process for cracking polyethylene or polypropylene to monomer comprising the following steps:

a. converting the polymer into liquid droplet form;

b. introducing to a reaction zone a cracking gas comprising steam and the polymer from step (a) and admixng said polymer with the cracking gas in said reaction zone

wherein the weight ratio of cracking gas to polymer is about 1 to about 8 parts of gas per part of polymer, the temperature of the cracking gas is such as to heat the polymer to a temperature in the range of about 800° C. to about 1050° C., and the residence time of the polymer and the products derived from the cracking thereof in the reaction zone is about 10 to about 100 milliseconds; and

c. quenching effluent from the reaction zone and recovering the monomer.

3,985,821

ADDITIVE FOR IMPROVING THE VISCOSITY INDEX OF LUBRICATING OILS AND LUBRICANTS SO OBTAINED

Pier Leone Girotti; Renato Tesei, and Telemaco Floris, all of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., Milano, Italy

Filed Mar. 12, 1974, Ser. No. 450,317

Claims priority, application Italy, Mar. 12, 1973, 21460/73

Int. Cl.² C07C *5/02*

U.S. Cl. 260—683.9 **3 Claims**

1. Process for the preparation of an additive for mineral or synthetic lubricating oils, capable of improving the viscosity index of said oils, wherein polymeric material of very high viscosity, boiling above 175° C, which is obtained through polymerization of normal alpha-olefines having the general formula $R—CH = CH_2$ wherein R is an alkyl radical containing from 2 to 16 carbon atoms, in the presence of the catalyst $TiCl_4$/polyiminoalane in a substantially inert atmosphere containing not more than the quantity of hydrogen which has a manometer pressure of 1 kg/cm² and by then recovering by distillation the fraction of the polymerization product boiling above 175° C, is subjected to a distillation at reduced pressure to a temperature which corresponds to a distillation temperature of 350° C at atmospheric pressure, and then subjecting the obtained product with an initial boiling point of 350° C to catalytic hydrogenation.

2. Additive for improving the viscosity index of lubricating oil when obtained by the process of claim **1.**

3,985,822

PROCESS FOR THE PRODUCTION OF POLY-N-BUTENES

James M. Watson, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Mar. 5, 1976, Ser. No. 664,141

Int. Cl.² C07C *3/18*

U.S. Cl. 260—683.15 B **5 Claims**

1. The method of forming liquid polybutene polymer having a molecular weight in the range of 335 to 1,300 and having an increased poly-n-butene content, said method comprising polymerizing a $C_3 - C_5$ liquified feed gas containing at least 3% of butylenes comprised of 10 to 70% isobutylenes and 10 to 30% n-butenes, at a temperature in the range of 65° to 115° F in the presence of from about 0.035 to 0.1% by weight of said hydrocarbon of dry aluminum chloride particles promoted with a minor quantity of a promoter.

3,985,823

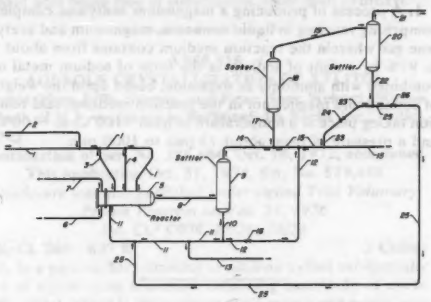
ISOPARAFFIN-OLEFIN ALKYLATION WITH HF ALKYLATION AND ISOMERIZATION IN A SOAKING ZONE

Jay E. Sobel, Highland Park, and Bipin V. Vora, Wheeling, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 426,980, Dec. 20, 1973, abandoned. This application Dec. 22, 1975, Ser. No. 643,570

Int. Cl.² C07C *3/54*

U.S. Cl. 260—683.42 **10 Claims**



1. A process for producing an alkylation reaction product from an isoparaffin and an olefin, which comprises the steps of:

a. reacting said olefin with said isoparaffin in admixture with a relatively low strength hydrogen fluoride catalyst containing 75 to 95 wt. percent HF at a catalyst to hydrocarbon volume ratio of 1:1 to 5:1;

b. settling the resultant reaction mixture of step (a) to separate the same into a hydrocarbon phase and a catalyst phase;

c. commingling with said hydrocarbon phase, without further addition of olefin, a relatively high strength catalyst of hydrogen fluoride and organic diluent containing 90 to 98 wt. percent HF, and 2 to 10 wt. percent of organic diluent, said catalyst having a higher strength than the catalyst utilized in step (a) and in a lower catalyst to hydrocarbon volume ratio than step (a);

d. introducing the resulting mixture of step (c) into a soaking zone and therein isomerizing lower octane alkylate hydrocarbons to higher octane alkylate hydrocarbons, converting alkyl fluorides into high quality alkylate and HF acid, by maintaining said mixture in the soaking zone at a temperature of 50° to 120° F for 5 to 20 minutes;

e. separating the effluent of the soaking zone into a second hydrocarbon phase and a second catalyst phase, and;

f. recovering said alkylation reaction product from said second hydrocarbon phase.

3,985,824

PROCESS FOR PREPARING IMPACT RESISTANT POLYVINYL AROMATICS

Michael Lederer, Falkenstein, Taunus; Wolfgang Strobel, Hofheim, Taunus, and Horst Jastrow, Niederhochstadt, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 5, 1975, Ser. No. 555,699

Claims priority, application Germany, Mar. 7, 1974, 2410918

Int. Cl.² C08L *43/04, 83/10;* **C08F** *255/06, 283/12*

U.S. Cl. 260—827 **10 Claims**

1. A process for preparing an impact resistant vinyl aromatic graft copolymer having improved notch impact strength and improved stability to atmospheric corrosion which comprises the steps of partially polymerizing at least one monomeric vinyl aromatic compound in the presence of an ethylene/propylene/tercomponent rubber by mass polymeri-

zation to form a pre-polymerizate and completing the polymerization of said pre-polymerizate by suspension polymerization, said mass polymerization being carried out in the presence of an oxygen-containing gas at an elevated pressure.

3,985,825

ADDUCTS, CONTAINING EPOXIDE GROUPS, BASED ON POLYESTERDICARBOXYLIC ACIDS

Rolf Schmid, Gelterkinden; Friedrich Lohse, Oberwil; Willy Fatzer, Bottmingen, and Hans Batzer, Arlesheim, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

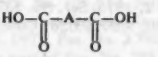
Filed Dec. 6, 1974, Ser. No. 530,333

Claims priority, application Switzerland, Dec. 19, 1973, 17808/73

Int. Cl.² C08L *63/00, 63/10*

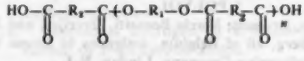
U.S. Cl. 260—835 **8 Claims**

1. An epoxide resin composition consisting essentially of advanced adducts containing epoxide groups, and advanced adducts being formed from (1) an adduct containing epoxide groups, which has been obtained by reaction of (a) a polyepoxide compound with (b) 0.3–0.5 carboxyl group equivalent, per 1 epoxide equivalent of the polyepoxide compound (a), of a long-chain aliphatic polyesterdicarboxylic acid of the formula I



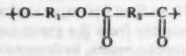
(I)

wherein A denotes a long-chain polyester residue in which unsubstituted or substituted alkylene and/or alkenylene chains alternate with carboxylic acid ester groups and the quotient Z/Q, wherein Z is the number of carbon atoms present in the recurring structural element of the residue A and Q is the number of oxygen bridges present in the recurring structural element of the residue A, must be at least 4 and wherein, furthermore, the total number of carbon atoms present in the residue A is at least 50, and (2) 0.3–0.5 carboxyl group equivalent per 1 epoxide equivalent of the adduct (1) containing epoxide groups, of a polyester-dicarboxylic acid of the formula II



(II)

which is different from the polyester of formula I wherein R_1 and R_2 each is a member selected from the group consisting of divalent aliphatic residue, divalent araliphatic residue, divalent cycloaliphatic residue, divalent cycloaliphatic-aliphatic residue, divalent aromatic residue and divalent heterocyclic-aliphatic residue and at least one of the two residues R_1 and R_2 must contain a carbocyclic or heterocyclic ring or a ring system of this type and the recurring structural element of the formula



does not contain more than 3 methylene groups per ring and *n* denotes a number from 1 to 30.

3,985,826

HYDROGENATED BLOCK COPOLYMERS OF BUTADIENE AND ISOPRENE

Shingo Futamura, Seville, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 484,486, July 1, 1974. This application May 8, 1975, Ser. No. 575,851

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² C08F *15/04, 15/40*

U.S. Cl. 260—876 B **11 Claims**

1. A hydrogenated block copolymer of improved permanent set and related properties comprising essentially at least 5–15 alternating blocks of hydrogenated butadiene and hydrogenated isoprene, which hydrogenated isoprene block may contain up to 50 percent by weight of hydrogenated butadiene, the hydrogenated butadiene portions representing 5–70 percent by weight and the hydrogenated isoprene portions representing 30–95 percent by weight, based on the total copolymer weight, each block of said copolymer being equivalent to a molecular weight of 1,000–100,000.

3,985,827

ORIENTED FILMS FROM HIGH ACRYLONITRILE POLYMER COMPOSITIONS

Clive William Frederick Hicks, London, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 8, 1973, Ser. No. 358,347

Claims priority, application United Kingdom, May 19, 1972, 23613/72; Aug. 31, 1972, 40319/72

Int. Cl.² C08L *51/00, 53/00*

U.S. Cl. 260—876 R **5 Claims**

1. An oriented film having a Gardner haze of less than 10% having been drawn in two directions to a ratio of at least 1.7:1 at a temperature of between 105° and 155° C and formed from a blend of:

a. a homogeneous copolymer resin derived from units of acrylonitrile (70 to 93% molar) and at least one aromatic olefine (30 to 7% molar) selected from styrene and α-methyl styrene; with

b. a graft copolymer having a diene rubber substrate and a superstrate which is a homogeneous copolymer derived from units of acrylonitrile (70 to 93% molar) and at least one aromatic olefine (30 to 7% molar) selected from styrene and α-methyl styrene,

the blending containing 5 to 15% by weight of rubber and the refractive indices of the substrate and superstrate being within 0.005 of that of the homogeneous copolymer resin.

3,985,828

FLAME-RETARDED ACRYLIC MULTIPOLYMER-VINYL CHLORIDE POLYMER COMPOSITIONS

Howard Robert Lucas, Danbury, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 455,452, March 27, 1974, abandoned. This application June 24, 1975, Ser. No. 589,966

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² C08L *51/00, 53/00*

U.S. Cl. 260—876 R **6 Claims**

1. A composition of matter comprising (1) a mixture of from about 40 to about 95 percent, by weight, of a polymeric material comprising (a) from about 70 to about 95 percent, by weight, of a terpolymer of 65–75 parts of methyl methacrylate, 15–25 parts of styrene and 1–15 parts of acrylonitrile and (b) from about 5 to about 30 percent, by weight, of polybutadiene grafted with 65–80 parts of methyl methacrylate, 15–25 parts of styrene and 1–15 parts of acrylonitrile, (2) from about 5 to about 60 percent, by weight, of a thermoplastic, non-cross-linked vinyl chloride polymer and (3) a stabilizing amount of an additive comprising (A) a compound having the formula

$R_xSn(SR')_{4-x}$

wherein x is 1–3, inclusive, R is alkyl, aralkyl, alkaryl, or aryl, R′ is the same as R or may include a carboxylic acid residue or a carboxylic acid ester residue, or (B) a barium-cadmium complex, containing (4) from about 0.025 to about 5.0 percent, by weight, based on the total weight of said composition, of dicyclopentadienyl iron or chromium acetyl acetonate.

3,985,829

HIGH IMPACT POLYBLENDS FROM HYDROGENATED BUTADIENE POLYMERS

John C. Falk, Des Plaines, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed June 19, 1974, Ser. No. 480,891

Int. Cl.² C08L *51/04, 9/00*

U.S. Cl. 260—879 **7 Claims**

1. A thermoplastic polyblend composition comprising the product of the free-radical polymerization of from 95 to 40 parts by weight of at least one vinyl monomer selected from the group consisting of styrene, alpha-methyl styrene, vinyl toluene, acrylonitrile, alpha-chloroacrylonitrile, methacrylonitrile, methyl acrylate and methyl methacrylate, said polymerization having been carried out in the presence of from 5 to 60 parts by weight of a hydrogenated rubbery polymer selected from the group consisting of homopolymers and copolymers of 1,3-butadiene having greater than 30% of the butadiene units as 1,2-polymerized units, said rubbery polymer having had substantially all ethylenic unsaturation removed by hydrogenation, wherein no greater than 5% of the product of the free-radical polymerization is grafted to the rubbery polymer.

3,985,830

STAR POLYMERS AND PROCESS FOR THE PREPARATION THEREOF

Lewis J. Fetters and Le-Khac Bi, both of Akron, Ohio, assignors to the University of Akron, Akron, Ohio

Filed July 15, 1974, Ser. No. 488,676

Int. Cl.² C08F *236/10*

U.S. Cl. 260—880 B **21 Claims**

1. A polymer product comprising:

a nucleus having more than one molecule of m-divinyl-benzene; and,

at least three polymeric arms linked to said nucleus, wherein said polymeric arms are selected from the group consisting of homopolymers and copolymers of conjugated diene monomers and block copolymers of conjugated diene and monovinyl aromatic monomers wherein said conjugated diene block is linked to said nucleus.

3,985,831

FLAME RETARDANT GRAFT POLYMER COMPOSITIONS PREPARED FROM PHOSPHINYL-SUBSTITUTED ACRYLONITRILES

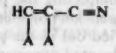
Nicodemus E. Boyer, Parkersburg, W. Va., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed June 30, 1975, Ser. No. 591,374

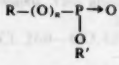
Int. Cl.² C08L *9/00*

U.S. Cl. 260—880 R **4 Claims**

1. A flame retardant composition comprising a graft copolymer prepared by copolymerizing a phosphinyl-substituted acrylonitrile monomer of the formula:



wherein one A is a phosphinyl group of the formula:



wherein R and R′ are independently selected from the group 1 to 4 carbon atom alkyl, halo-substituted 1 to 4 carbon atom alkyl, and 2 to 4 carbon atom alkenyl, and *n* is 0 or 1, and the remaining A is selected from the group —H, 1 to 4 carbon atom alkyl, and halo-substituted 1 to 4 carbon atom alkyl, with at least one vinyl monomer copolymerizable therewith, in the presence of from 10% to about 45% by weight based on the total composition of a rubbery polymer of a 4 to 6 carbon atom conjugated diene and a bis-(haloaryloxy)alkane of the formula:

$$X_n—Ar—O—(CH_2)_m—O—Ar—X_n$$

wherein X is a halogen selected from the group chlorine, fluorine, bromine and iodine, Ar is substituted phenylene or naphthylene, *m* is 1 to 6 and *n* is 1 to 7.

3,985,832

METHOD OF COVULCANIZING CHLORINATED LOW UNSATURATION RUBBERS WITH HIGH UNSATURATION RUBBER

Neil F. Newman, Edison, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 2, 1975, Ser. No. 537,857

Int. Cl.² C08L *9/00, 23/28;* **C08C** *19/32*

U.S. Cl. 260—888 **17 Claims**

1. A composition of matter comprising a chlorinated low unsaturation rubber and a halogen-containing C_1 to C_{20} organic compound wherein the halogen is bonded to a carbon atom, wherein said carbon atom is bonded to 1 to 3 functional groups capable of stabilizing the positive charge at the halogen-carbon bond, and wherein the halogen is selected from the group consisting of bromine or iodine.

3,985,833

SELF-SEALING FILMS COMPRISING A POLYOLEFIN AND A PARTIAL ESTER OF A CARBOXYLIC ACID AND A POLYOL

Federico Argurio, Brussels; Mario Borsatti, Overijse, and Jan Heindrijckx, Berg, all of Belgium, assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed June 11, 1975, Ser. No. 585,743

Claims priority, application United Kingdom, July 9, 1974, 30353/74

Int. Cl.² C08L *23/06*

U.S. Cl. 260—897 R **18 Claims**

1. A composition suitable for fabricating into a self-sealing film comprising:

i. 85 to 99.8 wt.% of a thermoplastic polyolefin,

ii. 0.1 to 10.0 wt.% of a partial ester of a carboxylic acid having 10 to 24 carbon atoms and a polyol and

iii. either 0.1 to 10 wt.% of hydrogenated amorphous hydrocarbon resin selected from the group consisting of hydrogenated polyterpene resins, hydrogenated coumaroneindene resins and hydrogenated resins derived from a petroleum distillate fraction or 0.1 to 10 wt.% of polybutene or polyisobutene, provided the combined weights of (ii) and (iii) is not more than 15 wt.%.

3,985,834
PHOSPHAZENE COMPOSITION

James T. F. Kao, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 339,902, March 9, 1973, abandoned. This application June 12, 1973, Ser. No. 369,221
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976
Int. Cl.[2] C07F 9/15
U.S. Cl. 260—927 N 8 Claims

1. In a process for the preparation of a fire retardant phosphonitrilate polymer consisting essentially of the steps of (a) heating a phosphonitrilic halide with at least a stoichiometric amount of an alkali metal compound of the formula MOR, wherein M is an alkali metal and R is a hydrocarbyl or halogen-substituted hydrocarbyl radical having up to about 8 carbon atoms to produce a phosphonitrilate polymer, (b) reacting a phosphonitrilic halide with less than the stoichiometric amount of said alkali metal compound producing a phosphonitrilate polymer containing a substantial amount of residual halide groups and (c) heating the phosphonitrilate polymer of (a) with the phosphonitrilate polymer containing a substantial amount of residual halide groups of (b) under conditions sufficient to drive off an organic halide, whereby the viscosity of the resultant phosphonitrilate polymer and its average molecular weight are increased, the improvement comprising preparing at least one of the polymers of (a) and (b) by a process of adding said alkali metal compound to said phosphonitrilic halide, said phosphonitrilic halide being contained in an inert solvent such that during the reaction a substantial excess of said phosphonitrilic halide is maintained.

3,985,835
HALOGENATED ESTERS OF PHOSPHORUS-CONTAINING ACIDS

Gaetano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

Division of Ser. No. 383,513, July 30, 1973, Pat. No. 3,886,237, which is a continuation-in-part of Ser. No. 179,543, Sept. 10, 1971, Pat. No. 3,780,144, which is a continuation-in-part of Ser. No. 785,335, March 19, 1968, abandoned. This application Nov. 22, 1974, Ser. No. 526,229
Int. Cl.[2] C07F 9/24
U.S. Cl. 260—956 13 Claims

1. A phosphorus-halogen-nitrogen-containing compound having the formula

$$R'''_3NP(O)(ORCX{=}CXR')_2$$

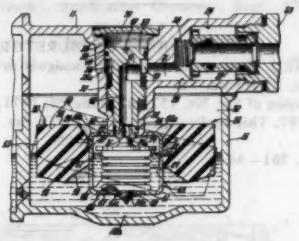
wherein
X represents Cl or Br;
R represents a divalent hydrocarbon radical of 1–20 carbon atoms;
R′ represents H, X or R″;
R″ represents a monovalent hydrocarbon radical of 1–20 carbon atoms; and
R‴ represents hydrogen or a monovalent hydrocarbon radical of 1–20 carbon atoms.

3,985,836
ALTITUDE COMPENSATED CARBURETOR FLOAT VALVE

Earl R. Fischer, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1975, Ser. No. 562,462
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.[2] F02M 5/06
U.S. Cl. 261—39 A 3 Claims

1. In a carburetor having body means arranged to provide a fuel reservoir chamber, a vertical bore through said body means opening into said chamber, a substantially horizontal inlet passage in said body means extending to said vertical bore, a cylindrical inlet seat member adjustably secured in said vertical bore in sealed relation thereto, passage means in said inlet seat member in communication with said vertical bore and said inlet passage, said passage means including a tubular valve seat member having an annular valve seat open to said fuel reservoir chamber and, a float aneroid assembly positioned in said fuel reservoir chamber, said float aneroid

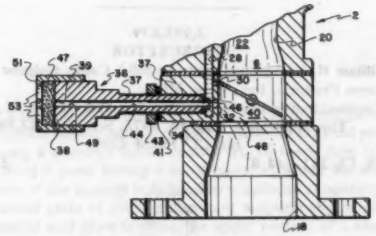


assembly including a float of toroidal configuration and an aneroid mounted concentrically therein with one end of said aneroid fixed relative to said float and with its opposite end free for axial movement relative to said float and a semi-spherical valve fixed to said opposite end of said aneroid in position to co-act with said valve seat to control flow of fuel into said fuel reservoir chamber.

3,985,837
VENTED NEEDLE VALVE FOR CARBURETOR IDLE PORT

Howard P. Rock, 5034 Del Rio, Salt Lake City, Utah 84117

Continuation-in-part of Ser. No. 404,468, Oct. 9, 1973, Pat. No. 3,865,907. This application Feb. 10, 1975, Ser. No. 548,851
Int. Cl.[2] F02M 3/08
U.S. Cl. 261—41 D 1 Claim



1. A needle valve for use in a carburetor having a throat, a fuel passage, an idle port communicating the fuel passage with the throat, and an internally-threaded bore of greater diameter than the idle port extending between the idle port and the exterior of the carburetor, said needle valve consisting of:

an externally-threaded shaft adapted to be adjustably received in the internally-threaded bore of the carburetor with a first end thereof coaxially aligned in proximity with the idle port, a second end of said shaft formed to provide means to permit manual rotation of said shaft to adjust the spacing between said first end and the idle port, lock means adjustably mounted to the external threads of the shaft and adapted to be caused to releasably engage the exterior of the carburetor to permit subsequent inadvertent displacement once the shaft has been adjusted, said shaft having a single, unobstructed, straight, centrally disposed axial air passage covered at its inlet by a disposable air filter of synthetic resinous material, the filter

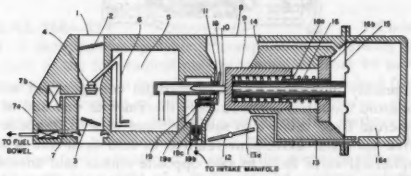
being placed adjacent said inlet whereby adjustment in the threaded location of the shaft requires removal of the filter, the axial air passage extending completely through said shaft and providing direct communication therethrough of ambient atmospheric air and a press-fit pervious cap to retain the filter when in place and which can be removed to accommodate removal of the filter and adjustment to the shaft.

3,985,838

HIGH VELOCITY CARBURETOR

Frederick J. Marsee, Clawson, Mich., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 157,087, June 28, 1971, Pat. No. 3,768,787. This application Mar. 20, 1973, Ser. No. 343,097
Int. Cl.² F02M 9/06
U.S. Cl. 261—44 R **7 Claims**



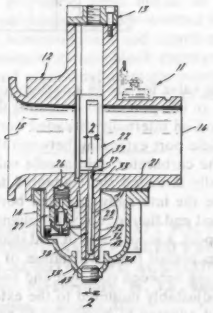
1. In a carburetor having a slidable member for varying the venturi cross-section and concurrently varying the amount of fuel metered into said venturi, the improvement which comprises a fuel enrichment device, said device comprising a vane located in said venturi, one end of which is pivotably mounted on the side wall of said venturi at a location opposite said slidable member and downstream of a fuel orifice, said vane being normally aligned with the axis of said venturi along said side wall, means for pivoting said vane in response to a decrease in intake manifold vacuum whereby the leading edge of said vane inclines toward said slidable member reducing the cross-section of said venturi.

3,985,839

CARBURETOR

William H. Edmonston, Lake Isabella, Calif., assignor to Lectron Products, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 563,594, March 31, 1975. This application May 30, 1975, Ser. No. 582,392
Int. Cl.² F02M 9/06
U.S. Cl. 261—44 R **5 Claims**



1. A carburetor comprising a body with inlet and outlet ends, a throat extending through said body from one end to the other, a throttle slide in said body extending transversely to said throat at an intermediate portion thereof, said slide being movable to vary the unblocked portion of said throat, a fuel tube extending transversely to said throat and having an opening into the throat, a pin disposed in said tube and being tapered with the narrowest portion of said taper adjacent said opening, means for causing relative reciprocation between said pin and tube, a shoulder integrally formed on said pin and extending substantially at right angles thereto from the widest end of said taper, whereby movement of said shoulder toward said opening will cause the shoulder to create a pumping action on the fuel in said tube and thereby increase the flow of fuel into said throat, and a passage extending from the adjacent end of said pin through said shoulder.

3,985,840

METHOD OF INTRODUCING MICROPOROSITY INTO MEMBRANES AND MAKING CAPSULES HAVING MICROPOROUS CAPSULE WALLS

David A. Hofacker, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 196,807, Nov. 8, 1971, which is a continuation-in-part of Ser. No. 823,164, May 8, 1969, abandoned. This application Dec. 20, 1973, Ser. No. 426,477
Int. Cl.² B29C 13/00
U.S. Cl. 264—4 **11 Claims**

1. A method of introducing microporosity into a membrane capable of retaining a liquid comprising the steps of

a. forming a single, homogeneous liquid phase, comprising a first material and a second material, at a temperature above the melting points of said materials, said first material being incompatible with said second material when said liquid phase is cooled to room temperature, the volume contraction ratio, being at least about 1.2,

b. permitting said liquid phase to cool to room temperature, whereby said first material separates out as a dispersed solid phase and creates micropores which extend completely through said membrane.

6. A method of making capsules comprising a substantially spherical wall enclosing a liquid fill material comprising the steps of:

a. forming a single, homogeneous liquid phase by blending a first material and a second material at a temperature above the melting points of said materials, said first material being incompatible with said second material when said liquid phase is cooled to room temperature, the volume contraction ratio, being at least about 1.2,

b. forming said liquid phase into an encapsulating cylindrical stream of liquid concentrically enclosing a core stream comprising a fill liquid at a temperature below the said melting points of said materials,

c. permitting heat exchange to occur between said encapsulating cylindrical stream and said core stream, thereby causing said first material to separate out from said homogeneous liquid phase as a multiplicity of microscopic particles dispersed throughout said homogeneous liquid phase and further causing said homogeneous liquid phase to solidify and provide a solid continuous matrix for said particles, while causing said cylindrical stream to constrict and form substantially spherical walls enclosing discrete amounts of said fill liquid, and

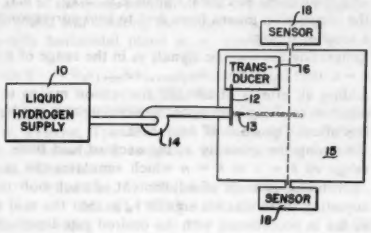
d. hardening said spherical walls into solid, microporous capsule walls.

3,985,841

METHOD AND MEANS FOR PRODUCING SOLID EVACUATED MICROSPHERES OF HYDROGEN

Robert J. Turnbull, Urbana; Christopher A. Foster, Champaign, both of Ill., and Charles D. Hendricks, Livermore, Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 6, 1975, Ser. No. 629,244
Int. Cl.² C01B 4/00
U.S. Cl. 264—9 4 Claims



1. A method for producing solid, evacuated microspheres comprised of hydrogen, including the steps of:

a. forming a jet of liquid hydrogen;

b. exciting mechanical waves on the jet to induce said jet to break up into drops and to induce bubbles to form within said drops;

c. subjecting said drops with bubbles therein to a pressure less than the vapor pressure of said liquid hydrogen so that said bubbles expand at a desired rate; and

d. freezing said drops thereby forming solid, evacuated microspheres of hydrogen.

3,985,842

METHOD OF MAKING ELECTRICAL MAGNESIA

John J. Scott, Niagara Falls, Canada, assignor to Norton Company, Worcester, Mass.

Filed July 3, 1972, Ser. No. 268,739
Int. Cl.² B01J 2/02
U.S. Cl. 264—12 5 Claims

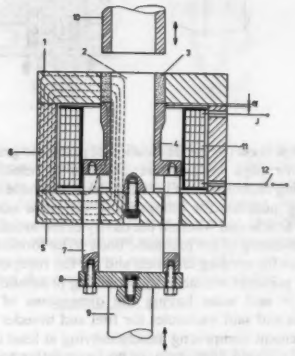
1. A method of making a granular electrical insulating material for use in electrical resistance heaters comprising fusing a commercial source of magnesia in the presence of from 10% to 40% by weight of additives selected from the group consisting of alumina and silica, and alumina, silica and lime, and then air quenching the molten magnesia composition in a compressed air stream to produce solidified spheres more than 40% of which are capable of passing through a 35-mesh Tyler screen, crushing the larger sized spheres of the air quenched magnesia composition to pass through a 35 mesh Tyler screen, and providing a homogeneous mixture of the crushed and air quenched smaller spheres useful for such electrical insulation.

3,985,843

PROCESS FOR MOLDING RING MAGNETS FOR RADIALLY ORIENTED PARTICLES

Erich Steingroever, Bonn, Germany, assignor to Magnetfabrik Bonn GmbH vorm. Gewerkschaft Windhorst, Bonn am Rhein, Germany

Continuation of Ser. No. 289,315, Sept. 15, 1972, abandoned.
This application Nov. 11, 1974, Ser. No. 522,873
Claims priority, application Germany, Sept. 17, 1971, 2146552
Int. Cl.² B22F 1/00
U.S. Cl. 264—24 9 Claims

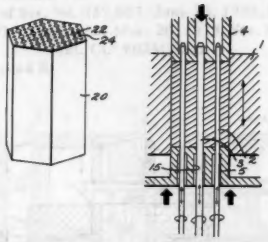


1. In a process for compression molding ring-shaped permanent magnets having radially oriented particles, the final product having a coercive field intensity $_jH_c$ of more than 1000 A/cm using a press having a mold cavity in which the outer periphery of the magnet is defined by a cylindrical opening in a horizontal plate of abrasion resistant magnetically permeable material said plate forming the upper portion of a closed generally toroidally shaped magnetic path including lines of force flowing in radial directions through the mold defined in part by said horizontal plate, the return portion of said path being disposed below said plate, the inner periphery of said magnet being defined by a cylindrical ram of abrasion resistant magnetically permeable material disposed concentrically with said opening and forming another portion of said magnetic path, said press also including upper and lower annular rams surrounding the cylindrical ram and axially movable into the annular space in said plate to form the respective end walls of a magnet, and means for energizing a magnetic field having lines of force following said closed toroidally shaped path, the improvement which comprises the steps of using a lower ram of abrasion resistant magnetically permeable material, and positioning the upper surface of said lower ram within the mold at a distance above the lower surface of the mold sufficient to close the mold prior to introducing powdered magnetic raw material into the cavity thus formed and insufficient to significantly distort the radial direction of said lines of force through the lower end of the mold.

3,985,844
PROCESS FOR THE PRODUCTION OF PRISMATIC GRAPHITE MOLDED ARTICLES FOR HIGH TEMPERATURE FUEL ELEMENTS

Hans Huschka, Grossauheim; Lothar Rachor, Kleinauheim; Milan Hrovat, Rodenbach, and Willi Wolff, Kahl, all of Germany, assignors to Nukem G.m.b.H., Germany

Filed July 12, 1973, Ser. No. 378,610
Claims priority, application Germany, July 14, 1972, 2234587
Int. Cl.² B29C 25/00
U.S. Cl. 264—29.1 **11 Claims**

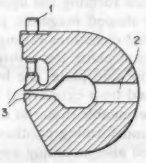


1. In a process for the fabrication of prismatic graphite molded bodies for high temperature reactors by molding a binder containing carbonaceous pressing mass in a molding die having stamping punches for compressing the mass and heating the molded article and wherein the cavity of the molding die has the outer geometry of the prismatic body to be formed and wherein vacancies for cooling channels and for the reception of fuel and breeder particles are made by providing prismatic displacement bodies in said mass having the dimensions of said cooling channels and said vacancies for fuel and breeder materials the improvement comprising axially moving at least one of (a) said die, and (b) said displacement bodies relative to the stamping punches, during the molding with attendant lowering of the friction between the molding mass and the stamping punches.

3,985,845
METHOD FOR CONTROLLING THE GAP BETWEEN LIPS OF A DIE FOR EXTRUDING A PLASTIC SHEET MATERIAL

Takeaki Akatsuka; Katsuichi Kitagawa; Hiroyoshi Amo, and Osamu Mita, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 31, 1974, Ser. No. 474,946
Claims priority, application Japan, June 12, 1973, 48-65376
Int. Cl.² B29D 7/02
U.S. Cl. 264—40.5 **6 Claims**



1. A method for controlling the gap between the lips of a die for extruding a plastic sheet-like material, said die including a pair of flat plates opposite to and spaced from each other and having a plurality of spaced-apart adjusting bolts at spaced points along the width of the gap, each bolt being deformed within its elastic limit, and wherein a simulator is connected electrically to provide a plurality of electrical signals each corresponding to the turning of a corresponding adjusting bolt, the steps which comprise:

1. simulating displacement of the gap between lips of the die at the location of each of the adjusting bolts while taking into account the interaction between separate bolt adjustments that are individually made, by conversion means associated with each adjusting bolt to produce electric signals corresponding to the angular turning movement of each adjusting bolt, in which said electric signals have the form x_k, where n is the number of bolts, and where k is the bolt number starting sequentially from the one end and progressing to the other, and wherein said signals x_k correspond to operational amounts of rotation of each bolt, and wherein said signals generate electric signals corresponding to a_1x_k, a_2x_k, - - - a_ex_k for the respective bolts, which signals simulate the gap displacement due to adjustment of the bolt having each k number by multiplying effective coefficients a_1, a_2 - - - a_e to x_k considering the effect on the gap distribution which is obtained by rotating the bolt which has that k number, where each a designates a weighing resistor which weighs the adjustment of each bolt having consideration of the fact that its adjustment is affected by the adjustment of its neighbors,
2. obtaining these electrical signals a_1x_k, a_2x_k - - - a_ex_k for all the conversion means from k=1 to k=n corresponding to a total of n bolts,
3. generating the electric signals y_k in the range of $k = 1$ to $k = n$, that is $y_k = a_1x_{k-f} + a_2x_{k-i+1} + a_{e/2+1}x_k + - - - + a_ex_{k+1}$ by adding all effects of all said conversion means to the k position of the gap in order to simulate the gap between lips at each position of each bolt,
4. obtaining the quantity x_k for each of said bolts, in the range of $k = 1$ to $k = n$ which simulates the required operational amount of adjustment of each bolt through adjusting these electric signals y_k so that the said signals y_k are in accordance with the desired gap distribution by controlling the values of x_k using each of the said conversion means, and
5. adjusting said bolts in accordance with the adjustment settings of said conversion means, for obtaining the desired gap spacing.

3,985,846
CERAMIC FIRING PROCESS

Christian Bent Lundsager, and Robert Matthews Murch, both of Ashton, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,634
Int. Cl.² B01J 37/00
U.S. Cl. 264—44 **2 Claims**

1. In a process for preparing porous ceramic structures with good resistance to cracking during firing wherein a composition consisting essentially of a polyolefin, a ceramic filler and a plasticizer is homogeneously blended, said composition is shaped to form a plastic structure, whereupon said plasticizer is extracted with an appropriate solvent and said polyolefin is subsequently removed by heating to form a porous ceramic structure, the improvement which consists of soaking said extracted ceramic structure in an aqueous solution of ½% synthetic surfactant for 8 to 16 hours prior to said heating.

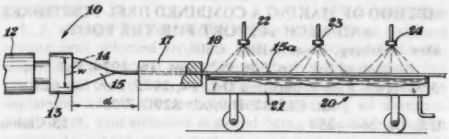
3,985,847
METHOD FOR THE EXTRUSION OF FOAM SHAPES

Kun Sup Hyun, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 23, 1974, Ser. No. 508,369
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² B29D 27/00; B29F 3/00
U.S. Cl. 264—51 **4 Claims**

1. In a method for the preparation of an elongate synthetic resinous thermoplastic extruded foamed article wherein a heat-plastified synthetic resinous extrudable foamable composition is passed under pressure through a die, the die having an orifice, the orifice having an elongate cross-sectional configuration having a major axis wherein the ratio of the major dimension of the cross-sectional configuration of the die orifice to the minor dimension thereof is at least 2 to 1 and the foamable composition is extruded from the orifice to form a

heat-plastified unsupported extrudate which foams to provide a plurality of closed gas filled cells and passing the foamed extrudate through a reshaping die having an extrudate receiving and shaping channel therein wherein the channel has a cross-section which is elongate and has a major to minor axes ratio of at least 2, cooling the extrudate within the channel to



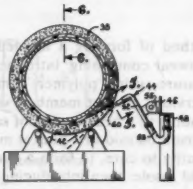
a generally self-supporting shape and subsequently cooling the resultant extrudate to about ambient temperature, the improvement which comprises extruding the extrudate with the major axis of the cross-section of the extrudate in a generally vertical plane and rotating the major axis of the extrudate to a generally horizontal plane at an entrance to the shaping channel.

3,985,848

METHOD FOR CUTTING CONCRETE COATED PIPE

Onno F. Frische, Tynaarlo, and Hans De Kok, Hoogezand, both of Netherlands, assignors to Bredero Price, B.V., The Hague, Netherlands

Filed Dec. 5, 1974, Ser. No. 529,803
Int. Cl.² B28B *1/48, 11/14*
U.S. Cl. 264—88 **2 Claims**



1. A method of cutting a circumferential groove through an uncured concrete coating on a generally cylindrical pipe, having a curved outer surface on which said coating is applied, said method comprising:

supporting said pipe with the axis of curvature of said curved outer surface extending substantially horizontally;

projecting a jet stream of water in a downward direction transverse to said axis and tangent to said curved surface of said pipe at a point at least 45 circumferential degrees below the plane of said axis; and

effecting relative rotation between said coated pipe and said jet stream, about said axis at a rate of from 5 to 10 r.p.m.

3,985,849

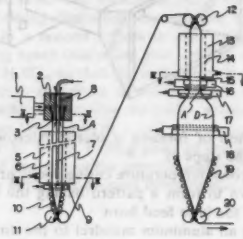
PREPARATION OF BIAXIALLY ORIENTED POLYVINYL ALCOHOL FILM

Ryohta Notomi; Tuyoshi Shigeyoshi, and Masayoshi Sugiyama, all of Fuji, Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1974, Ser. No. 522,279
Claims priority, application Japan, Nov. 26, 1973, 48-131735
Int. Cl.² B29D *7/24;* **D01D** *5/12;* **D01F** *6/14*
U.S. Cl. 264—95 **6 Claims**

1. A method for preparing polyvinyl alcohol film which comprises

1. melt-blending a mixture comprising polyvinyl alcohol having a degree of polymerization of 1,100 to 2,000 and a degree of hydrolysis of not less than 98% by mole and 70 to 110 parts by weight of water per 100 parts by weight of said polyvinyl alcohol in an extruder,
2. extruding the melted mixture through a circular slit of a die in tubular form.
3. drying the extruded tubular film from both the inside and outside to provide a non-stretched film having a degree of crystallization of from 20% to 44% and a water content of not more than 20% by weight.
4. collapsing the tubular, non-stretched film,
5. heating and inflating the collapsed, non-stretched film to obtain a biaxially oriented film, said film being stretched at a ratio of not less than 2 in each of the machine and transverse directions, whereby the heating provides a



temperature of the film at a starting point of stretching in a range from about 60° C to about 150° C and a maximum temperature in the middle portion of a stretching zone extending from the starting point to a point where the inflated tube reaches a maximum diameter, the difference between the maximum and minimum temperatures in the stretching zone being not more than 15° C, and

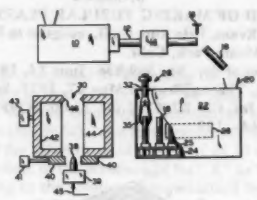
6. recovering the resulting biaxially oriented film.

3,985,850

ADJUSTING PARISON ALIGNMENT BY TEMPERATURE CONTROL OF PICKER FINGER

Charles L. Seefluth, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 29, 1975, Ser. No. 581,615
Int. Cl.² B29C *17/07*
U.S. Cl. 264—98 **5 Claims**



1. In a method of forming biaxially oriented hollow articles comprising in combination, heating an oriented open end thermoplastic parison to orientation temperatures;

grasping an upper end of said parison with opposed picker fingers;

transferring said parison into position with a bottom end thereof over a neck forming plug; and longitudinally stretching and expanding said parison while at said orientation temperature, the improvement comprising correcting misalignment of said parison relative to said plug by adjusting a temperature of a finger on a side opposite a direction said bottom end of said parison is shifted away from said plug to a lower temperature than a temperature of the other finger.

3,985,851

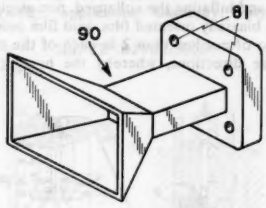
METHOD OF FORMING A FEED HORN

William L. MacTurk, Claremont, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed June 24, 1974, Ser. No. 482,732

Int. Cl.[2] H01P *11/00*

U.S. Cl. 264—104 1 Claim



1. A method of forming a plastic microwave feed horn comprising the steps of:

pouring a room temperature curing epoxy plastic into a base feed horn to form a pattern having the interior dimensions of the base feed horn;

machining an aluminum mandrel to the dimensions of the plastic pattern;

forming a tool steel mold apparatus around the machined aluminum mandrel, said mold apparatus including right and left side molds disposed between top and bottom plates to define a mold cavity around said aluminum mandrel;

injection molding a thermoplastic into said mold cavity to form a plastic microwave feed horn around said aluminum mandrel;

removing the molded plastic microwave feed horn from the mold assembly;

removing the aluminum mandrel from the molded plastic microwave feed horn;

wet vapor honing the molded plastic microwave feed horn to sensitize the feed horn for plating;

electroless copper plating the molded plastic feed horn;

electrolytic copper plating the electroless copper plated feed horn; and

gold plating the copper plated feed horn.

3,985,852

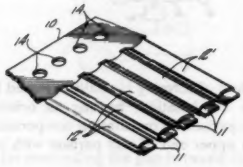
METHOD OF MAKING TUBULAR PLASTIC SLEEVES

Joseph H. Evans, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 369,836, June 14, 1975, Pat. No. 3,894,731. This application May 27, 1975, Ser. No. 580,596

Int. Cl.[2] B29C *17/00*, *23/00*; B29F *5/00*

U.S. Cl. 264—132 5 Claims



1. A method of forming flattened sleeves having printed indicia thereon, comprising the steps of disposing over individual ones of a plurality of flat tines spaced one apart from another and transversely pendant from at least one side of an elongate spine individual ones of a plurality of tubular plastic sleeves heat shrinkable to a lesser diametral dimension, and heating said sleeves about said tines to bring the former into snug and slidable relation conforming to the flat configuration of said tines and printing indicia on flat portions of said sleeves while said sleeves are conformed to flattened portions of said tines.

3,985,853

METHOD OF MAKING A COMBINED HEEL POSITIONER AND ARCH SUPPORT FOR THE FOOT

Alex Weisberg, Beverly Hills, Calif.

Division of Ser. No. 506,392, Sept. 16, 1974, Pat. No. 3,927,140. This application Oct. 14, 1975, Ser. No. 621,873

Int. Cl.[2] B29D *9/00*; B29G *7/00*

U.S. Cl. 264—250 13 Claims

1. The method of forming a molded arch support insert insole for footwear comprising: introducing a first quantity of room-temperature-curing polymer composition into a first flexible, impervious, pocket member, said first pocket member corresponding to a heel portion of said insole; positioning a heel of a person on said first pocket member while allowing said first quantity to cure, to form a heel positioning support portion of said insole; then introducing a second quantity of said composition into a second flexible, impervious pocket member corresponding to an arch support portion of said insole; curing said second quantity of said composition, while pressing a portion of a foot of said person on said second pocket member and while positioning a heel of said foot on said heel positioning support portion of said insole, to mold said second quantity of said composition to the shape of adjacent portions of said foot, said first and second pocket members being connected at least during the curing of said second quantity of said composition, thereby forming said molded arch support insert insole.

3,985,854

RECOVERY OF PT/RH FROM CAR EXHAUST CATALYSTS

Christopher William Bradford, and Stephen George Baldwin, both of London, England, assignors to Johnson Matthey & Co., Limited, London, England

Filed May 29, 1975, Ser. No. 581,889

Claims priority, application United Kingdom, June 12, 1974, 26043/74

Int. Cl.[2] C01G *55/00*

U.S. Cl. 423—22 9 Claims

1. A process for recovering at least one precious metal from the group consisting of platinum and rhodium from a catalyst containing same employed in the conversion of exhaust gases from internal combustion engines, said process comprising the step of reacting the catalyst with a mixture of HCl and bromine to leach out said metal.

3,985,855

RECOVERING COPPER VALUES FROM OXIDIZED ORES

Philip R. Haskett; Donald J. Bauer; Carl H. Elges, III, and Roald E. Lindstrom, all of Reno, Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 9, 1975, Ser. No. 576,393
Int. Cl.² C01G 3/00
U.S. Cl. 423—27 4 Claims

1. A process for recovering copper values from oxidized copper ores selected from the group consisting of azurite, malachite, chrysocolla and mixtures thereof, which comprises leaching the ore with an alkali metal hydroxide leach solution containing added siliceous material consisting of diatomaceous earth, said siliceous material being added in sufficient amount to inhibit the dehydration of hydroxy copper (II) complex and to maintain said complex in solution.

3,985,856

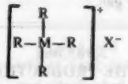
REMOVAL OF IRON FROM AQUEOUS ACID SOLUTIONS CONTAINING IRON AND COPPER

Morris A. Johnson, and Kang Yang, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Feb. 6, 1975, Ser. No. 547,668
Int. Cl.² C01G 49/02
U.S. Cl. 423—43 5 Claims

1. A process for removing ferric ions from an aqueous acid solution without removing a substantial portion of copper ions contained therein comprising the steps of:

combining with said aqueous acid solution in an amount of at least 0.01% by weight of said solution a compound soluble in said aqueous acid solution having the general formula



wherein:

M is nitrogen or phosphorus,

R is butyl, and

X is an anion derived from organic or inorganic acids or hydroxide;

adjusting the pH of said acid solution to a value in the range of from about 2.0 to about 2.5 so that a substantial amount of ferric ions contained in said solution are hydrolyzed and precipitated but a major portion of the copper ions contained therein remain in said solution; and

then separating the precipitate from said acid solution.

3,985,857

PROCESS FOR RECOVERING ZINC FROM FERRITES

Francisco Javier Sitges Menendez, and Vicente Arregui Fernandez, both of Salinas, Spain, assignors to Asturiana de Zinc, S.A., San Juan de Nieva, Castrillon, Spain

Filed Aug. 9, 1973, Ser. No. 387,191
Claims priority, application Spain, Oct. 20, 1972, 407811
Int. Cl.² C22B 19/22
U.S. Cl. 423—106 4 Claims

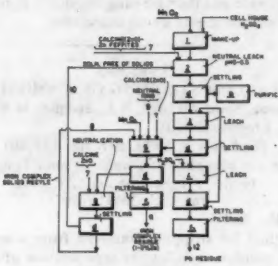
1. In a process for recovering zinc values from the residue of a neutral leach of zinc calcine, said residue containing zinc ferrite and heavier metals, while maintaining atmospheric pressure and a temperature of about 90° to 95° C., which comprises:

a. treating said residue with a solution having an H_2SO_4 concentration of about 180 to 200 g./l., decanting to separate the undissolved residue, the resulting solution having an H_2SO_4 concentrate of greater than 10 g./l.;

b. treating the undissolved residue with a solution having an H_2SO_4 concentration of at least 300 g./l. to obtain a resulting solution containing zinc sulphate and iron sulphate, said resulting solution having a sulfuric acid concentration of 180 to 200 g./l.;

c. separating undissolved residue from said resultant solution (b); and

d. recycling said solution to step (a); the improvement consisting of (i) adding Na^+, K^+ or NH_4^+ ions to said resultant solution (a); (ii) neutralizing solution (i) in a first step with zinc oxide or other appropriate zinc-containing agent until its acidity is 10 to 100 g./l of H_2SO_4, so that some of the iron contained in the solution separates therefrom in the form of complex basic sulphate solids, said solids containing 1 to 3 percent by weight Zn,; (iii) settling said solids and separating said solids by filtering; (iv) neutralizing the solids-free solution resulting from step (iii) in a second step with zinc oxide or another neutralizing agent containing zinc until its acidity is 2 to 10 g./l. of H_2SO_4, so that the iron remaining in said solution separates therefrom in the form of complex basic sulphate solids; (v) settling the solids, whereby a solution (V) with an Fe content of 1 to 3 g./l. results; a temperature of 50° C. to the boiling point of the solution being maintained throughout the process, and any Fe^{++} existing or forming during the process being oxidized by MnO_2 or air.



4. The process comprised of: dissolving the zinc oxide and ferrites contained in zinc calcine in a first stage with strong H_2SO_4 solution formed from spent electrolyte and, as required, concentrated H_2SO_4, at a temperature of 50° C. to the boiling point of the solution, until an acidity of 10 to 100 g./l. of H_2SO_4 is reached, in the presence of Na^+, K^+ or NH_4^+ ions, any Fe^{++} existing in the solution being oxidized by MnO_2 or air, whereby some of the iron precipitates in as a solid complex basic sulphate, said solids containing 1 to 3 percent by weight Zn, said sulphate and the undissolved residue are separated by settling and filtering, said residue containing Fe, Pb and Ag; the resultant solids-free solution is gradually neutralized in a second stage with calcine until its pH is 5 to 5.5, at a temperature of 50° C. to the boiling point of the solution, any Fe^{++} present being oxidized with MnO_2 or air, precipitating the Fe out as a solid complex basic sulphate and $Fe(OH)_3$; separating said precipitate by settling and sending said precipitate to the first stage to dissolve out zinc oxide and zinc, copper and cadmium ferrites present in said precipitate, while the complex basic sulphate in said precipitate remains unchanged and serves for crystal seeding to make easier the separation of the iron present in the solution in its complex basic sulphate form.

3,985,858

TREATMENT OF ZINC HYDROXIDE SLURRY AND RECOVERY OF ZINC-CONTAINING PRODUCT THEREFROM

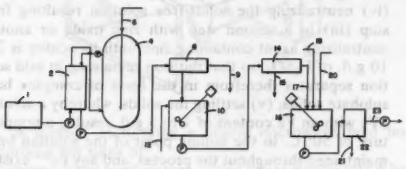
John H. Cosgrove, Media, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 159,441, July 2, 1971, Pat. No. 3,886,258. This application Apr. 8, 1975, Ser. No. 566,646

The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.

Int. Cl.[2] C01G *9/02*, *9/06*

U.S. Cl. 423—106 15 Claims



1. A process for improving the filtration characteristics of solids in a dilute aqueous slurry of hydrated zinc oxide which comprises elevating the temperature of said slurry to at least 257° F. under an elevated pressure sufficient to prevent essentially any loss of the water in the slurry and for a time sufficient to decrease the water of hydration content of the hydrated zinc oxide and then treating the slurry to recover filterable solids including zinc oxide therefrom.

3,985,859

VACUUM STRIPPING OF AMMONIA

Louis I. Blaine, South Orange, N.J., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed July 3, 1974, Ser. No. 485,401

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.[2] C01C *3/00*

U.S. Cl. 423—238 9 Claims

1. A method for stripping ammonia from a spent alkaline regenerant solution used for the regeneration of a zeolite ion exchange bed; comprising the steps of:

a. directing the spent alkaline regenerant solution downwardly through a stripping column;

b. passing a gas upwardly through the column countercurrent to the flow of alkaline regenerant solution;

c. circulating an acidic working solution continuously from a holding tank through a vacuum creating means and then back into the holding tank; and

d. withdrawing stripped ammonia from the stripping column under a vacuum created therein by said vacuum creating means so as to cause said stripped ammonia to chemically react with said acidic working solution to form an ammonium salt solution.

3,985,860

METHOD FOR OXIDATION OF SO_2 SCRUBBER SLUDGE

Bernard G. Mandelik, and Walter A. Cronkright, both of Houston, Tex., assignors to Pullman Incorporated, Chicago, Ill.

Filed Sept. 22, 1975, Ser. No. 615,454

Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—242 9 Claims

1. In a process for removing sulfur oxides from industrial waste gas by contacting the waste gas with a first aqueous medium containing sodium carbonate, calcium hydroxide, or calcium carbonate and precipitating calcium sulfite as a by-product, the improvement which comprises oxidizing at least part of the precipitated calcium sulfite to calcium sulfate with an oxygen-containing gas at an oxygen partial pressure of from about 2 to about 100 psia in a second aqueous medium containing at least 3 weight percent magnesium sulfate.

3,985,861

PROCESS FOR REMOVING SULFUR COMPOUNDS FROM CLAUS OFF-GASES

Henry C. Hudson, Jr., Pasadena, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sept. 16, 1974, Ser. No. 506,377

Int. Cl.[2] C01B *17/00*; B01J *8/00*; C01B *17/02*

U.S. Cl. 423—244 12 Claims

1. In a process for decreasing the total sulfur content of off-gases from a Claus process wherein the off-gases containing SO_2 and other convertible sulfur compounds are mixed with a reducing gas containing a gas selected from hydrogen, carbon monoxide, and mixtures thereof, and passed at a temperature in excess of about 175° C over a sulfided Group VI/Group VIII metal catalyst supported on an inorganic oxidic carrier to reduce the SO_2 and other convertible sulfur compounds to H_2S, followed by cooling of the H_2S-containing gaseous stream at least partially by direct cooling with a water-containing liquid quench stream and removal of the H_2S from the cooled gaseous stream by contact with an absorbent or adsorbent for H_2S, in which process the flow of either or both of the SO_2 containing off-gases and the reducing gas over the metal catalyst is controlled by monitoring the SO_2 content of the reduced gas stream, the improvement which comprises carrying out of the monitoring of the SO_2 content of the catalytically reduced gas stream by stripping a portion of the water-containing liquid quench stream with an inert gas to remove H_2S and CO_2 absorbed while cooling the H_2S containing gaseous stream, and measuring the pH of the stripped quench liquid; and utilizing the measurement obtained to control the flow of either or both of the SO_2-containing off-gases and the reducing gas.

3,985,862

PROCESS FOR THE PRODUCTION OF SODIUM PERBORATE

Gerd Knippschild, Rheinfelden-Beuggen, and Hubert Schuster, Rheinfelden-Karsau, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Continuation-in-part of Ser. No. 391,997, Aug. 27, 1973, abandoned, and a continuation-in-part of Ser. No. 391,998, Aug. 27, 1973, abandoned. This application June 6, 1975, Ser. No. 584,530

Claims priority, application Germany, Sept. 2, 1972, 2243341; Sept. 2, 1972, 2243342

Int. Cl.[2] C01B *15/12*

U.S. Cl. 423—281 17 Claims

1. A process for the production of abrasion resistant, coarse sodium perborate tetrahydrate by reacting aqueous sodium metaborate solution with aqueous hydrogen peroxide in the absence of free active oxygen and free alkali in the reaction medium and additionally comprising introducing a strongly supersaturated solution of sodium perborate tetrahydrate having a concentration of 200 to 700 grams per liter of said perborate tetrahydrate into a previously prepared suspension of aqueous sodium perborate mother liquor and sodium perborate tetrahydrate innoculant crystals which contains 100 to 500 grams per liter of suspension of said crystals, the rate of introduction being such that not more than 30 grams of said perborate tetrahydrate grow as crystals per minute per sq. meter of apparent innoculant surface area at 20° to 40° C. and a rate of crystallization growth of not more than 100%.

9. A process for the production of abrasion resistant coarse sodium perborate tetrahydrate by reacting sodium metaborate and hydrogen peroxide in an aqueous suspension of seeds of sodium perborate tetrahydrate in a saturated solution of the perborate and wherein the sodium perborate tetrahydrate crystallizes in a crystallizer and additionally comprising adding to the perborate suspension after said suspension leaves the

crystallizer a clear sodium perborate tetrahydrate supersaturated aqueous solution containing 200 to 700 grams of sodium perborate tetrahydrate per liter at 40° to 50° C., said clear solution having been prepared by reacting sodium metaborate and hydrogen peroxide in water.

3,985,863

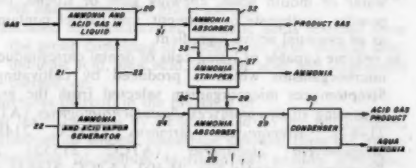
PROCESS FOR THE SEPARATION AND RECOVERY OF AMMONIA AND ACID GASES

Robert D. Rice; Thomas H. Bossler, both of Monroeville Borough, Allegheny County, and Charles W. Hamilton, Jr., North Huntingdon Township, Westmoreland County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 376,089, July 2, 1973, abandoned. This application Apr. 18, 1975, Ser. No. 569,632

Int. Cl.² C01C *1/00*

U.S. Cl. 423—352 6 Claims



1. A method of recovering ammonia substantially free of acid gases from vapor containing ammonia and acid gases, and at least 50% by volume of water vapor, comprising washing the vapor with a solution containing ammonium phosphate at or near its boiling point and distilling or stripping NH_3 from said solution.

3,985,864

CONTROL SYSTEM FOR SULFUR PROCESS

Lucien H. Vautrain, and Herbert A. Ems, both of Sweeny, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 25, 1974, Ser. No. 526,939

Int. Cl.² C01B *17/04*

U.S. Cl. 423—574 R 10 Claims

1. A process for the production of sulfur comprising passing a first stream containing hydrogen sulfide into a combustion zone, passing a second stream containing oxygen into said combustion zone to therein convert a portion of the hydrogen sulfide of said first stream to sulfur dioxide, withdrawing the resulting combustion products from said combustion zone, passing the withdrawn combustion products to a reaction zone and therein reacting hydrogen sulfide and sulfur dioxide contained in said combustion products to produce sulfur, withdrawing the reaction effluent from said reaction zone, separating the thus withdrawn reaction effluent into a liquid sulfur stream and a stripped gas stream, utilizing a pressure sensor to measure the pressure of said first stream and establish a first signal representative thereof, utilizing a flow sensor to measure the flow rate of said first stream and establish a second signal representative thereof, utilizing analytical apparatus to determine the ratio of the concentration of hydrogen sulfide in said stripped gas stream to the concentration of sulfur dioxide in said stripped gas stream and establish a third signal representative thereof, utilizing control system components to establish a fourth signal responsive to said second and third signals, and utilizing control system components to control the rate of flow of said second stream responsive to the lower of said first and fourth signals to maintain the desired ratio of hydrogen sulfide to oxygen fed to said combustion zone despite any changes in the pressure of said first stream and any variation in the concentration of hydrogen sulfide in said first stream and in the concentration of oxygen in said second stream.

3,985,865

METHOD FOR THE GENERATION OF HYDROGEN

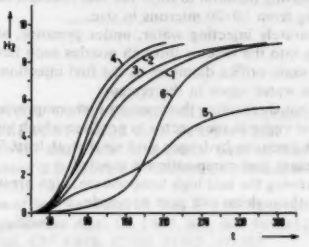
Karl Hohne, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 28, 1975, Ser. No. 572,514

Claims priority, application Germany, May 3, 1974, 2421538

Int. Cl.² C01B *1/07, 1/02*

U.S. Cl. 423—657 3 Claims



1. In a method for generating gaseous hydrogen comprising reacting with water particles of magnesium or a combination of magnesium and aluminum, in a weight ratio of magnesium to aluminum of between about 7:1 to 2:6, said particles being admixed with an oxide of cobalt selected from the group consisting of tricobalt tetraoxide (CO_3O_4) and dicobalt trioxide (CO_2O_3), said reaction occuring in the presence of a water soluble chloride selected from the group consisting of alkali metal chlorides and magnesium chloride, wherein the amount of cobalt oxide is from about 0.5 to 5.0% by weight of total metal and the amount of water-soluble chloride is from about 5 to 200% by weight of total metal;

the improvement which comprises conducting said reaction in the presence of a molybdenum compound selected from the group consisting of a molybdenum oxide or an inorganic molybdenum salt in an amount of from about 0.5 to 5% by weight based on the weight of the total metal.

3,985,866

METHOD OF PRODUCING HIGH-PRESSURE HYDROGEN CONTAINING GAS FOR USE AS A POWER SOURCE

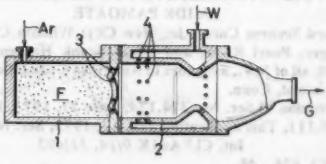
Noriyuki Oda; Takashi Yoshida; Takeshi Nakanishi; Kensuke Yoshikawa; Akira Adachi; Jitsuhiko Ueda, and Toshihiro Mizota, all of Osaka, Japan, assignors to Hitachi Shipbuilding and Engineering Co., Ltd., Osaka, Japan

Filed May 15, 1975, Ser. No. 577,817

Claims priority, application Japan, Oct. 7, 1974, 49-115794; Dec. 9, 1974, 49-141714

Int. Cl.² C01B *1/08*

U.S. Cl. 423—657 7 Claims



1. A method of producing a high pressure hydrogen which comprises the steps of:

a. injecting into an essentially closed reactor vessel a fuel reactant composition consisting essentially of aluminum as a primary fuel component and at least one metal selected from the group consisting of an alkali metal and an

alkaline earth metal alloyed or admixed therewith and serving as an auxiliary fuel component in said fuel reactant composition, and said fuel reactant composition being injected into the reactor through injection nozzles, each measuring 0.3 – 1 mm. in the orifice diameter, in the form of molten droplets and at least 20° C higher, but not more than 200°C higher, than the melting point of said fuel reactant composition, and said fuel reactant composition being introduced from a fuel container pressurized to 5 kg/cm² with argon gas, and the aluminum employed as starting material to form the fuel reactant composition being from 10–20 microns in size;

b. separately injecting water, under pressure, at the same time into the reactor through nozzles each having nearly the same orifice diameter as the fuel injection nozzles to form water vapor in the reactor;

c. vigorously reacting the reactant fuel composition with the water vapor in the reactor to produce a high temperature, high pressure hydrogen and so that at least 90% of the reactant fuel composition is reacted;

d. removing the said high temperature, high pressure hydrogen through an exit port or nozzle.

3,985,867

IMMUNOASSAYS EMPLOYING A COLORED SECOND ANTIBODY

Martin Ralphs Redshaw, Amersham, England, assignor to The Radiochemical Centre Limited, England

Filed Dec. 26, 1974, Ser. No. 536,642

Claims priority, application United Kingdom, Jan. 2, 1974, 25/74

Int. Cl.² G01N *33/00*; **G01T** *1/16*; **G21H** *5/02*

U.S. Cl. 424—1.5 **3 Claims**

1. A method of performing an immunoassay, which method comprises the steps of:

i. incubating an aqueous mixture of the antigen to be assayed, a labelled version of the antigen, and a first antibody for the antigen in an amount insufficient to react with all the antigen, and

ii. effecting precipitation of a first antibody-antigen complex by the addition to the aqueous mixture of an aqueous solution of a second antibody which reacts with the said first antibody-antigen complex, so as to form a precipitate, characterized in that said second antibody is artificially colored, so as to form a colored precipitate.

3,985,868

ASTHMA TREATMENT BY INHALATION OF MICRONIZED N,N-DIETHYL-4-METHYL-1-PIPERAZINECARBOXAMIDE PAMOATE

Howard Seebree Corey, Jr., New City; William Charles Barringer, Pearl River, and Lloyd Frank Hansen, Campbell Hall, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 374,174, June 27, 1973, Pat. No. 3,895,111. This application Jan. 13, 1975, Ser. No. 540,735

Int. Cl.² A61K *9/14*, *31/495*

U.S. Cl. 424—45 **3 Claims**

1. A pressurized dispenser for the treatment of asthma containing a suspension consisting essentially of an effective amount of N,N-diethyl-4-methyl-1-piperazinecarboxamide pamoate having a particle size range of 0.5 microns to 10 microns, about 5% by weight of ethanol and a propelling amount of a low boiling chlorofluoalkane in a container having a metering valve.

3,985,869

DENTAL CARIES-INDUCING MICROORGANISM CELLS LYTIC ENZYME

Yoshio Yoshimura, Nishinomiya; Kanae Yokogawa, Nara, and Shigeo Kawata, Kobe, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Dosho, Japan

Division of Ser. No. 270,821, July 11, 1972, Pat. No. 3,929,579, which is a continuation-in-part of Ser. No. 180,711, Sept. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 68,944, Sept. 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 26,010, April 6, 1970, abandoned. This application Apr. 22, 1975, Ser. No. 570,369

Claims priority, application Japan, June 7, 1969, 44-45307; May 28, 1970, 45-46494

Int. Cl.² A61K *7/28*, *37/48*

U.S. Cl. 424—50 **6 Claims**

1. A composition for preventing and treating dental caries comprising

a conventional oral hygiene carrier, particularly including water or mouth wash, chewing gum or troche, tooth powder, toothpaste or ointment, said carrier containing as an essential active ingredient

an enzyme capable of lysing cells of dental caries-inducing microorganisms which is produced by cultivating a Streptomyces microorganism selected from the group consisting of *Streptomyces diastatochromogenes* (ATCC 21481), *Streptomyces farinosus* (ATCC 21482), *Streptomyces globisporus* (ATCC 21553) and *Streptomyces griseus* Var. H-402 (ATCC 21483) and mutants thereof and recovering the produced enzyme from the culture broth, said enzyme being contained in a dose unit of an effective amount of from 1 to 5,000 units, one unit of activity being defined as that amount of enzyme giving an initial linear decrease in optical density of 0.001 per minute of the reduction ratio of said bacteria cells, in turbidity, when the optical density of the reaction mixture of said cells, in lytic reaction with said enzyme, is measured at 600 mμ of a photoelectric colorimeter.

3,985,870

TOOTHPASTES

Arthur G. Holstein, Waukegan, Ill., assignor to Pfanstiehl Laboratories, Inc., Waukegan, Ill.

Continuation-in-part of Ser. No. 127,781, March 24, 1971, abandoned. This application Jan. 2, 1975, Ser. No. 537,900

Int. Cl.² A61K *7/16*

U.S. Cl. 424—57 **3 Claims**

1. A toothpaste containing at least 25% of a water-insoluble calcium compound polishing agent or abrasive selected from the group consisting of precipitated calcium carbonate, calcium pyrophosphate, calcium orthophosphate, calcium metaphosphate, molecularly dehydrated calcium phosphates, tricalcium phosphate, dicalcium phosphate dihydrate, dicalcium phosphate anhydrous, and calcium sulfate, free from D-Galactono-1:4-Lactone, said toothpaste being free from the tendency of conversion to a stiff magma formed from the reaction of said calcium compound as calcium galactonate formed from the galactonic acid yielded from hydrolysis of D-Galactono-1:4-Lactone, said toothpaste containing from 0.5 to 20% of D-Glucoheptono-1:4-Lactone, said percentages being by weight of said toothpaste, the reaction of said calcium compound with the glucoheptonic acid formed by hydrolysis of said D-Glucoheptono-1:4-Lactone being noncrystallizable whereby to prevent formation of a stiff magma in the toothpaste.

3,985,871
PHARMACEUTICAL HEPARINOIDIC FACTOR-CONTAINING COMPOSITION AND THERAPEUTIC USE THEREOF

Adriano Butti, Como; Giuseppe Prino, Milan, and Marisa Mantovani, Como, all of Italy, assignors to Crinos Industria Farmacobiologica S.p.A., Como, Italy

Filed Mar. 26, 1975, Ser. No. 562,216

Claims priority, application Italy, Apr. 4, 1974, 50134/74

Int. Cl.² A61K *31/725, 35/38*

U.S. Cl. 424—104 **5 Claims**

1. An orally administrable therapeutic composition producing an antiplasmin inhibiting effect, comprising an anhydrous suspension of:

1. an effective amount to inhibit antiplasmin of a heparinoidic factor in
2. a suspending medium consisting of
   vegetable and animal fats selected from the group consisting of olive oil, peanut oil, coconut oil, corn oil, tributyrin and commercial grade axunge,
   saturated and unsaturated aliphatic acids selected from the group consisting of arachidonic acid, linoleic acid, linolenic acid, oleic acid, actanoic acid, and alkyl esters thereof, or
   mixtures thereof, in the presence of
3. at least 0.1 parts by weight based on the heparinoidic factor of an anionic dispersant selected from the group consisting of sodium taurocholate, sodium glycolate, sodium cholate, sodium laurylsulfate, dioctyl sodium sulfosuccinate, alkyl aryl sulfate, fatty acid-saccharose esters, polyoxyethylene sorbitan monolaurate, mannite monooleate, and polysorbate 20.

3,985,872
DIHYDRO-A204

James W. Chamberlin, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

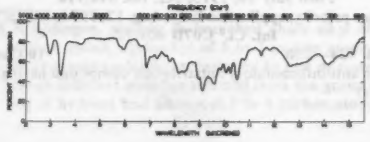
Filed Nov. 15, 1974, Ser. No. 524,179

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² A61K *35/00*

U.S. Cl. 424—122 **1 Claim**

INFRARED ABSORPTION SPECTRUM OF DIHYDRO-A204



1. Dihydro-A204, which is a white amorphous solid, soluble in diethyl ether, dimethylformamide, dimethyl sulfoxide, methyl acetate, ethyl acetate, amyl acetate; sulfoxide, acetone, methyl ethyl ketone, methyl isobutyl ketone; chloroform, carbon tetrachloride, dichloroethylene; benzene, toluene, xylene, methanol, ethanol, isopropanol and tert-butanol; and insoluble in water; and which has:

a. a molecular weight, as determined by the osmometric method, of 944;
b. an approximate elemental composition of 63.64% carbon, 9.11% hydrogen and 27.25% oxygen;
c. an empirical formula of $C_{50}H_{88}O_{15}$;
d. an infrared absorption spectrum in chloroform with distinguishable absorption maxima at 2.96, 3.40, 5.78 (strong), 5.95, 6.87, 7.30, 7.83, 9.00 (strong), 9.13, 9.42, 9.58, 9.87, 10.10, 10.25, 10.53 and 10.80 microns;
e. a nuclear magnetic resonance spectrum with the following characteristics: ($CDCl_3$) δ 3.30, 3.36, 3.43, 3.46 (CH_3O), 4.80 (-$\underset{|}{C}$H-O-) ppm;
f. in 66 percent aqueous dimethylformamide, one titratable group having a pKa of about 5.45; and
g. Rf values of 0.26 and 0.33 on silica-gel thin-layer chromatography in ethyl acetate-methanol (9:1); and which forms cationic salts, the sodium salt thereof having an infrared absorption spectrum in chloroform with absorption maxima at 3.0 (OH), 5.8, and 6.3 (CO_2^-) microns; or the physiologically-acceptable cationic salts thereof.

3,985,873
SOLUTION CONTAINING TRIMETHOPRIM, SULFACETAMIDE AND POLYMYXIN

George E. Alvan, and Elvin A. Holstius, both of Greenville, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 428,918, Dec. 27, 1973, abandoned. This application Apr. 18, 1975, Ser. No. 569,412

Int. Cl.² A61K *37/00, 31/63, 31/505*

U.S. Cl. 424—177 **10 Claims**

1. A clear aqueous pharmaceutically acceptable solution capable for use as an ophthalmic antibacterial preparation, the solution being at a pH of 4.0 to 6.5 and the solution containing 0.05 to 0.66 % w/v of sulfacetamide, 0.01 to 0.50% w/v of trimethoprim in the form of a pharmaceutically acceptable water soluble salt, and 0.01 to 3% w/v of polymyxin in the form of a pharmaceutically acceptable water soluble salt and water.

3,985,874
O-[1-ALKYL-OR-PHENYL-5-ALKYLMERCAPTOALKYL-MERCAPTO-1,2,4-TRIAZOL(3)YL]-(THIONO)-PHOSPHORIC(PHOSPHONIC, PHOSPHINIC) ACID ESTERS AND ESTER-AMIDES

Hellmut Hoffmann, Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

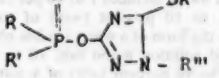
Filed Apr. 29, 1975, Ser. No. 573,273

Claims priority, application Germany, May 9, 1974, 2422548

Int. Cl.² A01N *9/36;* **C07** *9/65*

U.S. Cl. 424—200 **10 Claims**

1. An O-[1-alkyl or-phenyl-5-alkylmercaptoalkylmercapto1,2,4-triazol(3)yl-(thiono)-phosphoric(phosphonic, phosphinic) acid ester or ester-amide of the formula



(I)

in which

R is alkyl or alkoxy, each with 1 to 6 carbon atoms,
R' is alkyl, alkoxy or alkylamino, each with 1 to 6 carbon atoms, or phenyl,
R'' is alkylmercaptoalkyl with 1 to 4 carbon atoms in each alkyl moiety,
R''' is alkyl with 1 to 4 carbon atoms or phenyl, and
X is oxygen or sulfur.

3,985,875

ω-(N-ACYLAMINO)ALKYLPHOSPHORYL ETHANOLAMINES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM, AND THEIR USES

Kouji Hayashi, Suita; Masahisa Hashimoto, Toyonaka; Kiyoshi Nakamura, Suita; Masanao Shimizu, Kobe; Naonobu Hatano, Takaishi, and Kunihiko Takeyama, Kashihara, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

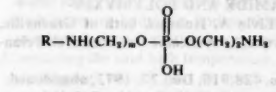
Filed Dec. 30, 1974, Ser. No. 537,601

Claims priority, application Japan, Jan. 12, 1974, 49-6774; Dec. 5, 1974, 49-140274

Int. Cl.² C07F 9/09; A01N 9/36

U.S. Cl. 424—211 24 Claims

1. ω-(N-Acylamino)alkylphosphoryl ethanolamines of the general formula



wherein R is octadeca-9,12-dienoyl, octadeca-9,12,15-trienoyl, 4-(4'-chlorophenoxy)phenoxyacetyl or α-[4-(4'-chlorophenoxy)phenoxy]propionyl, and *m* is 2 or 3,

or their pharmaceutically acceptable acid addition salts.

8. A pharmaceutical composition for the prevention and treatment of hypertension comprising a mixture of the ω-(N-acylamino) alkylphosphoryl ethanolamine or its pharmaceutically acceptable acid addition salt, as defined in claim 1, as an active ingredient, and a pharmaceutically acceptable carrier wherein the amount of said active ingredient is about 10 to 1500 mg in terms of a dosage unit per day.

3,985,876

CHEMOTHERAPEUTIC SOLUTIONS CONTAINING A SULPHUR AND A SALT OF A 2,4-DIAMINO-5-BENZYLPYRIMIDINE

John R. Hazlett, and Elvin A. Holstius, both of Greenville, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 428,917, Dec. 27, 1973, abandoned. This application May 7, 1975, Ser. No. 575,142

Claims priority, application United Kingdom, Jan. 5, 1973, 690/73

Int. Cl.² A61K 31/63, 31/635

U.S. Cl. 424—229 14 Claims

1. A clear solution which includes 1 to 40 per cent (*w/v*) of sulfamethoxazole, 1 to 10 percent (*w/v*) of trimethoprim calculated as base in the form of a water soluble pharmaceutically acceptable acid addition mono salt, 10 to 60 percent water (*v/v*) and 30 to 90 percent (*v/v*) of a water miscible organic solvent for the sulfamethoxazole, the solution having a pH of 4.0 to 7.0, and a solution in which the organic solvent is selected from the class consisting of N, N-dimethylacetamide, polyethylene glycols having average molecular weights from about 190 to 7500 and containing 2 to 159 ethylene glycol monomer units, 1, 2-propylene glycol, glycerin, hexamethylene glycol, 1,3-butylene glycol, ethanol, diethylacetamide, dimethylsulfoxide, dimethylformamide, di 1,2-propylene glycol, glycerin formal, polyethylene-glycoethers of tetrahydrofurfuryl alcohol and diethylene glycol.

3,985,877

AZIDO-S-TRIAZINE INSECTICIDES

Alexis Herzog, and Hans Ulrich Brechbuehler, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

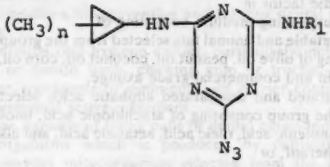
Continuation-in-part of Ser. No. 252,729, May 12, 1972, Pat. No. 3,853,868. This application Dec. 4, 1974, Ser. No. 529,428

Claims priority, application Switzerland, June 1, 1971, 7925/71; Apr. 10, 1972, 5214/72

Int. Cl.² A01N 9/00, 9/22

U.S. Cl. 424—249 6 Claims

1. A method of combating insects which comprises applying to insect larvae, pupae or adults an insecticidally effective amount of a compound of the formula



wherein R_1 represents hydrogen, cyclopropyl, 1-methylcyclopropyl, 2-methylcyclopropyl, C_1–C_5 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl or C_1–C_3 alkyl which is substituted by cyano, and *n* represents 0 or 1.

3,985,878

ANTI-INFLAMMATORY AND ANTIRHEUMATIC COMPOUNDS AND PREPARATION

Francesco Makovec, Taccona (Milan); Paolo Senin, Monza (Milan), and Luigi Rovati, San Fruttuoso di Monza (Milan), all of Italy, assignors to Rotta Research Laboratorium S.p.A., S. Fruttuoso di Monza (Milan), Italy

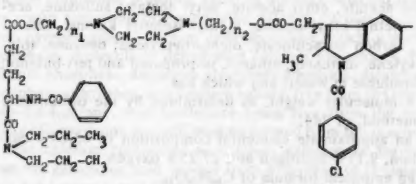
Filed July 10, 1975, Ser. No. 594,914

Claims priority, application Italy, Aug. 12, 1974, 69523/74

Int. Cl.² C07D 403/12

U.S. Cl. 424—250 10 Claims

1. An anti-inflammatory antiarthrosic compound having the formula:



wherein n_1 and n_2 are integers, either 2 or 3, or a salt thereof with a pharmaceutically acceptable acid.

3,985,879

ANTIBACTERIAL COMPOSITIONS CONTAINING A 4-AMINO-PYRIMIDO-(4,5,b)-QUINOXALINE-5,10-DIOXIDE AND METHOD OF USING SAME

Florin Seng, Cologne; Kurt Ley, Odenthal-Gloebusch, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

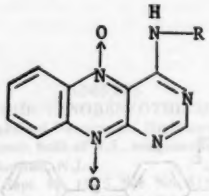
Continuation-in-part of Ser. No. 362,300, May 21, 1973, abandoned, which is a division of Ser. No. 160,542, July 7, 1971, Pat. No. 3,793,323. This application Oct. 2, 1974, Ser. No. 511,175

Claims priority, application Germany, July 11, 1970, 2034476

Int. Cl.[2] A61K *31/505*

U.S. Cl. 424—251 24 Claims

13. A method of preventing bacterial infections in humans and animals and treating bacterial infections in humans and animals which comprises administering to a human or animal in need thereof an antibacterially effective amount of a compound of the formula:



wherein

R is hydrogen, straight or branched chain alkyl of 1 to 6 carbon atoms, cycloalkyl of 5 to 7 carbon atoms or said alkyl or said cycloalkyl substituted by one or more identical or different moieties selected from the group consisting of hydroxy and alkoxy of 1 to 4 carbon atoms.

3,985,880

2-(R'-OXYMETHYL)-PERIMIDINES

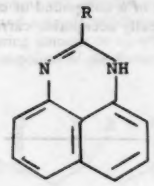
Vasken Paragamian, Dresher, Pa., and Russell J. Taylor, Jr., Palmyra, N.J., assignors to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Continuation-in-part of Ser. No. 380,983, July 19, 1973, abandoned. This application Feb. 7, 1975, Ser. No. 548,063

Int. Cl.[2] A61K *27/00*; C07D *239/00*

U.S. Cl. 424—251 14 Claims

1. The method of aiding the prevention and amelioration of stomach ulcers which comprises internally administering to a subject having stomach ulcers a pharmaceutical composition useful for treatment of said stomach ulcers in dosage unit form comprising per dosage unit from about 5 to about 500 mg of a member selected from the group consisting of a perimidine compound having the formula:



wherein R is a member selected from the group consisting of hydrogen, loweralkyl, cyanoloweralkyl, mercaptoloweralkyl, hydroxyloweralkyl, carbamyl, loweralkanoyloxymethyl, benzoyloxymethyl, carbamyloxymethyl, N-loweralkyl-carbamyloxymethyl, N,N-diloweralkyl-carbamyloxymethyl, loweralkoxy-loweralkyl, amino-loweralkyl, N-loweralkyl amino-loweralkyl and N,N-diloweralkylamino-loweralkyl, said loweralkyl and said loweralkoxy being straight or branch chained and having from 1 to 5 carbon atoms, and a therapeutically active acid addition salt thereof, as an active ingredient in admixture with a pharmaceutically acceptable carrier.

3,985,881

1(3,4,5-TRIMETHOXYBENZAMIDO METHYL) TETRAHYDRO ISOQUINOLINE DERIVATIVES AND A PROCESS FOR THEIR PRODUCTION

Werner Mehrhof; Rolf Pohlke; Karl Heinz Becker, and Hans-Jochen Schliep, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

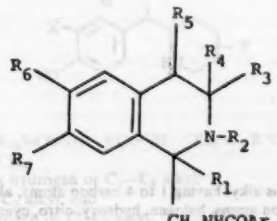
Filed Dec. 9, 1974, Ser. No. 530,553

Claims priority, application Germany, Dec. 10, 1973, 2361390

Int. Cl.[2] C07D *217/12*

U.S. Cl. 424—258 27 Claims

1. An isoquinoline of the formula



wherein R_1 and R_2 each are H or R_1 is H and R_2 is R_8 or R_1 and R_2 collectively are a C—N bond, R_3 is H, methyl or ethyl, R_4 and R_5 each are H or collectively a C—C bond, R_6 and R_7 each are H or methoxy, and Ar is 3,4,5-trimethoxyphenyl, R_8 being the acryl radical of an organic carboxylic acid of 1–10 carbon atoms, alkyl of 1–17 carbon atoms, or the corresponding alkyl substituted by one of phenyl, OH, ArCOO—, ArCONH—, piperidino, 3,4-dehydropiperidino, carboxy, carbomethoxy and carbethoxy, Ar in each instance being 3,4,5-trimethoxyphenyl, the physiologically acceptable acid addition salts thereof.

27. A pharmaceutical composition for the treatment of cardiovascular diseases comprising an amount from 20 to 500 mg. per unit dosage of a compound of claim 1 in admixture with a pharmaceutically acceptable carrier adapted for oral administration.

3,985,882

SUBSTITUTED BENZO[1J]QUINOLINZINE-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF AS BACTERICIDAL AGENTS

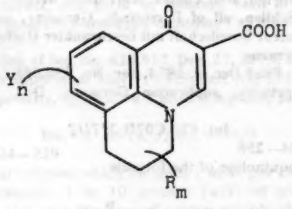
John F. Gerster, Woodbury, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 303,254, Nov. 2, 1972, Pat. No. 3,896,131, which is a continuation-in-part of Ser. No. 214,409, Dec. 30, 1971, abandoned. This application Jan. 22, 1975, Ser. No. 543,036

Int. Cl.² A01N *9/22*; A61K *31/47*

U.S. Cl. 424—258 **13 Claims**

1. A method for inhibiting the growth of bacteria which comprises administering to a mammal with said bacteria a bacterial growth-inhibiting amount of a compound of the formula:



wherein Y is alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, halogen, hydroxy, nitro, cyano, trifluoromethyl, amino, alkanamido having 1 to 4 carbon atoms, trifluoroacetamido or N, N-dialkylamino having 1 to 4 carbon atoms, R is methyl, ethyl or trifluoromethyl, *n* is zero, one or two, and when *n* is 2, Y may be methylenedioxy or ethylenedioxy bonded to adjacent ring positions, *m* is zero, 1 or 2, and when R is trifluoromethyl, *m* is one; or a pharmaceutically acceptable salt thereof.

3,985,883

PYRIDINE CONTAINING PHENOXYPIVALOPHENONE DERIVATIVES

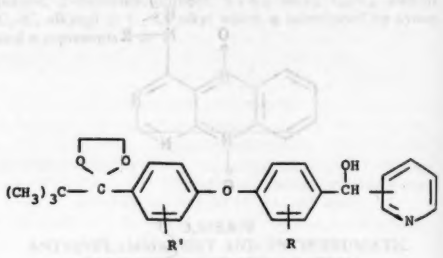
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Mar. 28, 1975, Ser. No. 563,160

Int. Cl.² C07D *405/12*; A61K *31/44*

U.S. Cl. 424—263 **17 Claims**

1. A compound which is an acetal of the formula



wherein each of R and R′ is, independently, a hydrogen atom, alkyl having from 1 to 4 carbons, or a halogen atom having an atomic weight of from about 19 to 35, provided that when any of R is at the 3 [2]-position, or R′ is at the 2′-position, it is not branched chain alkyl,

or a pharmaceutically acceptable acid addition salt thereof.

14. A method of treating obesity in a mammal, by administering to said mammal an amount of a compound of claim 1, effective in treating obesity in said mammal.

3,985,884

COMPLEMENT INHIBITORS

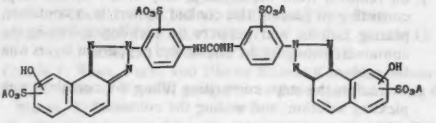
Ransom Brown Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 12, 1975, Ser. No. 640,097

Int. Cl.² C07D *249/22*

U.S. Cl. 424—269 **7 Claims**

1. A compound selected from those of the formula:



wherein A is H, Na or K, with the proviso that each A is identical in the same compound.

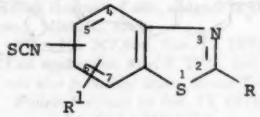
3,985,885

ISOTHIOCYANOBENZOTHIAZOLES

Venkatachala Lakshmi Narayanan, Hightstown, and Richard G. Angel, Trenton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 19, 1975, Ser. No. 615,027
Int. Cl.² C07D 417/04
U.S. Cl. 424—263 14 Claims

1. A compound having the formula



wherein SCN occupies the 5- or 6-position, R is pyridyl or thienyl or such heterocyclic radicals substituted with lower alkyl, halogen, phenylthio or lower alkoxy, and R^1 is a member selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, alkylthio, containing 1 to 7 carbons, naphthylthio, phenylthio, or halogen, R^1 occupying the 5- or 6-position and physiologically acceptable acid-addition salts thereof.

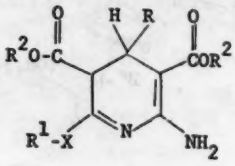
3,985,886

2-AMINO-4,5-DIHYDROPYRIDINE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Horst Meyer, Wuppertal; Freidrich Bossert, Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 336,481, Feb. 28, 1973, Pat. No. 3,876,646. This application Mar. 22, 1974, Ser. No. 453,930
Claims priority, application Germany, Mar. 6, 1972, 2210659
Int. Cl.² A61K 31/455
U.S. Cl. 424—266 82 Claims

1. A pharmaceutical composition for effecting coronary vessel dilation in humans and animals and for treating hypertension in humans and animals which comprises an effective coronary vessel dilating amount or an effective antihypertensive amount of a compound of the formula:



wherein

R is hydrogen; lower alkyl; phenyl; substituted phenyl in which the substituents are one to three members selected from the group consisting of lower alkyl, lower alkoxy, halogeno, nitro, cyano, trifluoromethyl, azido, carbo(-lower alkoxy), lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio and phenyl; or naphthyl;

each of R^1 and R^2, taken independently of the other, is lower alkyl, lower alkenyl or lower alkynyl; and

X is oxygen or sulfur;

in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier.

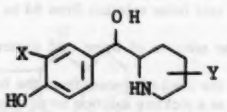
3,985,887

3-SUBSTITUTED-4-HYDROXYPHENYL-2-PIPERIDYL-CARBINOLS AS β-ADRENERGIC STIMULANTS

Carl Kaiser, Haddon Heights, and Joe R. Wardell, Jr., Willingboro, both of N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 408,147, Oct. 19, 1973, Pat. No. 3,910,933. This application June 11, 1975, Ser. No. 585,897
Int. Cl.² A61K 31/445
U.S. Cl. 424—267 10 Claims

1. A pharmaceutical composition in dosage unit form having β-adrenergic stimulant activity comprising a pharmaceutical carrier and an amount sufficient to produce β-adrenergic stimulant activity of a compound of the formula



where

X is $(R)_2NCONH$, $RCONH$, $(R)_2N$, $R'OCONH$, or $R'SO_2CH_2$;

each R is hydrogen or C_1—C_3 alkyl;

R′ is C_1–C_3 alkyl; and

Y is hydrogen or C_1–C_6 alkyl,

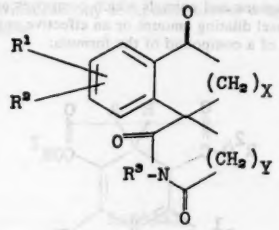
or a non-toxic pharmaceutically acceptable salt thereof.

3,985,888
METHODS OF INDUCING SEDATION USING CERTAIN SPIROALKANONE-IMIDES

Albert A. Carr, and Donald R. Meyer, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 844,613, July 24, 1969, Pat. No. 3,647,797. This application Apr. 12, 1971, Ser. No. 133,372
Int. Cl.² A61K *31/445, 31/40*
U.S. Cl. 424—267 6 Claims

1. A method of inducing sedation which comprises administering to a patient a compound of the formula:



wherein R^1 and R^2 represent hydrogen, halogen, lower alkyl, lower alkoxy, or nitro, and wherein R^1 and R^2 may be the same or different; R^3 may be hydrogen or lower alkyl; and X and Y may be one or two, in amounts between 0.02 milligram to 20 milligrams per kilogram of body weight.

3,985,889
METHOD OF TRANQUILIZING AND TREATING PAIN

Victor J. Bauer, Somerville, and Raymond W. Kosley, Jr., Convent, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 424,080, Dec. 12, 1973. This application July 1, 1975, Ser. No. 592,214
Int. Cl.² A61K *31/445*
U.S. Cl. 424—267 10 Claims

1. A method of tranquilizing and treating pain which comprises administering to a patient an effective amount of 1,3-dihydro-1'-[4,4-di(4-fluorophenyl)butyl]spiro[isobenzofuran-1,-4'-piperidine]-3-one.

3,985,890
PICKLED SEAFOOD

Ethel A. Brown, P.O. Box 305, Hoodsport, Wash. 98548

Filed Apr. 7, 1975, Ser. No. 565,404
Int. Cl.² A21D *4/00*
U.S. Cl. 426—324 1 Claim

1. A method for preparing pickled oysters which comprises:

a. preparing a brine solution consisting essentially of 256 volumes of water to about 4 to 16 volumes of salt;

b. adding to said brine solution from 64 to 256 volumes of oysters;

c. boiling the mixture of brine and oysters for about 20 minutes;

d. removing the cooked oysters from the brine;

e. preparing as a pickling solution an aqueous mixture of 80 to 320 volumes of water, 64 to 256 volumes of a sweetening agent selected from the class consisting of sugars and synthetic sweetening agents, 1 to 6 volumes of a flavoring agent selected from the group consisting of acetic, citric and tartaric acids, 1 to 4 parts by volume of one or more seasoning spices, and a preservative selected from the group consisting of salt or sodium benzoate, wherein about 10 parts to 40 parts by volume of salt, or ½ to 1 part by volume of sodium benzoate is employed;

f. on removal from the brine in step *d*, the further steps consisting of placing the cooked oysters in a container, placing onions, and peppers on pickling spices in the container, arranging the onions and peppers in layers with the oysters; and

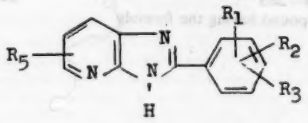
g. thereafter the steps comprising filling the container with pickling solution, and sealing the container.

3,985,891
2-PHENYL-IMIDAZO (4,5-b)PYRIDINES AND SALTS THEREOF

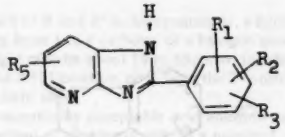
Eberhard Kutter; Volkhard Austel, both of Biberach an der Riss, and Willi Diederen, Rissegg, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 439,362, Feb. 4, 1974, abandoned. This application Aug. 22, 1975, Ser. No. 606,886
Claims priority, application Germany, Feb. 3, 1973, 2305339; Dec. 12, 1973, 2361757
Int. Cl.² A61K *31/395*; C07D *213/74*
U.S. Cl. 424—263 13 Claims

1. A compound of the formula



or



wherein

R_1 is alkoxy of 1 to 4 carbon atoms, allyloxy, benzyloxy, methoxy-ethoxy, methylthio, methylsulfinyl, methylsulfonyl or methylsulfinyl-ethoxy,

R_2 is hydrogen, hydroxyl, methyl, methoxy, ethoxy, fluorine, chlorine, (alkyl of 1 to 4 carbon atoms)-thio, (alkyl of 1 to 4 carbon atoms)-sulfinyl, (alkyl of 1 to 4 carbon atoms)-sulfinyl, (alkyl of 1 to 4 carbon atoms)-sulfonyl of Z—A—O

where

A is alkylene of 2 to 3 carbon atoms, and

Z is chlorine, hydroxyl, methylthio, ethylthio, methylsulfinyl, ethylsulfinyl, methylsulfonyl or ethylsulfonyl,

R_3 is hydrogen or methoxy,

or any two of R_1, R_2 and R_3 together are methylenedioxy, and

R_5 is hydrogen, chlorine or methyl,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,985,892

PHARMACEUTICAL PREPARATION FOR PERCUTANEOUS TREATMENT OF LOCAL EDEMAS EMPLOYING ACETAZOLAMIDE

Claude P. Roux, Paris, and Dieran Robert Torossian, Montrouge, both of France, assignors to Jouveinal S.A., Val de Marne, France

Continuation-in-part of Ser. No. 146,298, May 24, 1971, Pat. No. 3,934,016. This application Jan. 27, 1975, Ser. No. 544,039

The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.

Int. Cl.² A61K *31/425*

U.S. Cl. 424—270 4 Claims

1. A pharmaceutical composition for local external cutaneous treatment of a local subcutaneous edema of a human, the composition comprising a suspension for skin use consisting of the following:

10 parts of acetazolamide (5-acetamido-1,3,4-thiadiazole-2-sulfonamide),
10 parts of polyethylene glycol 300,
5 parts of stearic acid,
3.5 parts of liquid petrolatum,
3 parts of ascorbyl palmitate and
100 parts of water q.s.p.

3,985,893

METHOD FOR TREATING CARDIAC INSUFFICIENCY WITH ANTIBIOTIC A-23187

Donald R. Holland, and Mitchell I. Steinberg, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 29, 1974, Ser. No. 518,556

Int. Cl.² A61K *31/42*

U.S. Cl. 424—272 3 Claims

1. The method of enhancing the contractile force of mammalian heart muscle in a warm blooded mammal which comprises administering parenterally an effective non-toxic dose of between approximately 25 mcg./kg. and 500 mcg./kg. of body weight of the antibiotic A-23187 free acid or the calcium salt thereof.

3,985,894

METHOD OF CONTROLLING RICE BLAST WITH N-(ALKYLTHIOPHENYL)MALEIMIDES

Donald E. Bublitz, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

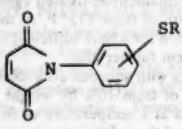
Division of Ser. No. 307,608, Nov. 17, 1972, Pat. No. 3,853,912. This application Aug. 9, 1974, Ser. No. 496,431

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² A01N *9/22*

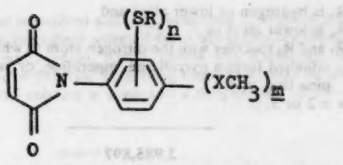
U.S. Cl. 424—274 11 Claims

1. A composition comprising an inert agriculturally acceptable carrier and a rice-blast controlling amount of a compound of the formula:



wherein SR is in the ortho- or meta- position and R is methyl.

4. A method for controlling rice blast on a rice plant comprising applying to the plant to be protected a rice blast controlling amount of a compound having the formula:



wherein $-(SR)_n$ is in the ortho or meta position; n is 0 or 1; m is 0 or 1, with the proviso that the sum of $n + m$ is always 1; R is an alkyl group of from 1 to 6 carbon atoms; and X is oxygen or sulfur.

3,985,895

N,N-DIETHYL-N'-{DIBENZO[b,e]THIEPIN-11(6H)-YLIDENE}-1,3-PROPANEDIAMINE AND DERIVATIVES THEREOF

Philippe Dostert, Versailles, France, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

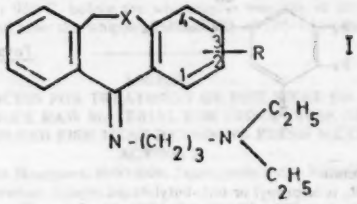
Filed Mar. 14, 1975, Ser. No. 558,401

Claims priority, application Switzerland, Mar. 20, 1974, 3879/74; Feb. 11, 1975, 1648/75

Int. Cl.² C07D *337/12*

U.S. Cl. 424—275 10 Claims

1. A compound of the formula



wherein

X is sulfur or sulfonyl and R is hydrogen or methyl,

or a pharmaceutically acceptable acid addition salt thereof.

3,985,896

BENZOPHENALENOFURANS

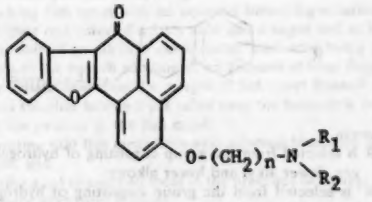
L. Martin Brenner, Havertown, and Charles K. Brush, Malvern, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed July 15, 1975, Ser. No. 596,114

Int. Cl.² C07D *307/80;* A61K *31/34*

U.S. Cl. 424—285 6 Claims

1. A compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, in which:

R_1 is hydrogen or lower alkyl and
R_2 is lower alkyl or
R_1 and R_2 together with the nitrogen atom to which they are attached form a pyrrolidine, piperidine, or perhydroazepine ring; and
n is 2 or 3.

3,985,897

OCULAR HYPOTENSIVE PROCESS EMPLOYING DEXTROROTATORY SULFONAMIDOPHENETHANOLAMINES

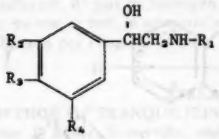
Richard J. Seidehamel, and Kendrick W. Dungan, both of Evansville, India, assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 427,274, Dec. 21, 1973, Pat. No. 3,885,047, which is a continuation-in-part of Ser. No. 263,496, June 16, 1972, abandoned. This application Nov. 14, 1974, Ser. No. 523,937

Int. Cl.² A61K *31/18*

U.S. Cl. 424—321 **7 Claims**

1. The process of lowering intraocular pressure in the eye of a mammal suffering from primary open angle glaucoma which comprises topical application thereto of an effective ophthalmologically acceptable amount for lowering intraocular pressure of the dextrorotatory stereoisomer substantially free of the levorotatory stereoisomer of a compound selected from the group consisting of a phenethanolamine having Formula I



Formula I

wherein
R_1 is isopropyl or tert.-butyl;
R_2 is methanesulfonamido; and one of
R_3 and R_4 is hydrogen and the other is hydroxy; and an ophthalmologically acceptable acid addition salt thereof said amount being substantially free of adrenergically mediated side effects.

3,985,898

THIOUREA DERIVATIVES

John Lambert Jackson, Exmouth, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

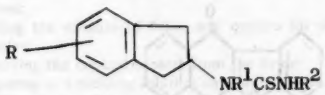
Filed Apr. 29, 1975, Ser. No. 572,783

Claims priority, application United Kingdom, May 17, 1974, 21980/74

Int. Cl.² A61K *31/17*

U.S. Cl. 424—322 **5 Claims**

1. A thiourea of the formula



wherein
R is selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy;
R^1 is selected from the group consisting of hydrogen and lower alkyl; and
R^2 is selected from the group consisting of hydrogen and benzoyl.

3,985,899

METHOD OF INHIBITING GROWTH OF TRANSPLANTED TUMOR CELLS

Gordon H. Svoboda, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 268,406, July 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 46,811, June 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 840,114, June 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 536,905, March 23, 1966, abandoned. This application June 28, 1973, Ser. No. 374,588

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² A61K *31/435*

U.S. Cl. 424—257 **3 Claims**

1. A method of inhibiting the growth of malignant transplanted tumor cells selected from the group consisting of adenocarcinoma, Ad-755; plasma cell myeloma, X-5563; Mecca lymphosarcoma, MLS; B-82 leukemia; C-1498 myelogenous leukemia; Sarcoma 180; Ridgeway osteogenic sarcoma and Shionogi carcinoma which comprises administering to a mouse in whose body the tumor is present and proliferating an effective oncolytic quantity of acronycine.

3,985,900

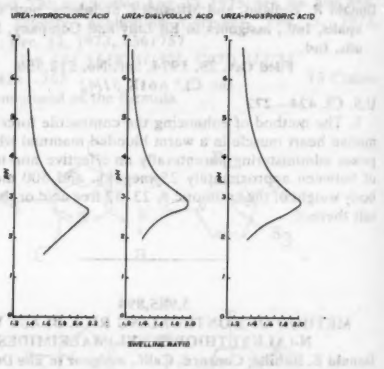
UREA-TREATING FISH EGG BAIT IN ACID MEDIUM

John Thomas Stephan, 13 Mount Hood Lane, Longview, Wash. 98632

Filed Aug. 1, 1975, Ser. No. 601,132

Int. Cl.² A23L *1/325*

U.S. Cl. 426—1 **22 Claims**



21. The process of making fish egg bait which comprises:
a. toughening the skins of fish eggs by soaking the eggs in brine having a salt concentration of from 0.1% to fully saturated with respect to salt, at a temperature of from just above the freezing temperature of the brine to 150° F. for a time sufficient to toughen the fish egg skins,
b. hardening the eggs in the brine solution by reacting them with a formaldehyde protein coagulant used in amount of from 0.2 to 0.7 pounds of formaldehyde per 100 pounds eggs,
c. cooking the formaldehyde-treated eggs in brine solution at a temperature of from 175° F. to the boiling point of the brine solution for a time sufficient to opacify the eggs and harden them further and
d. treating the egg with aqueous urea solution having a urea concentration of from 10% by weight to saturated with respect to urea at a temperature of from just above the freezing point of the solution to about 150° F. for a time sufficient to plasticize and swell the eggs and render them substantially translucent or transparent,
e. the urea solution containing at least one acid of the group consisting of sulfuric acid, hydrochloric acid, phosphoric

acid, sulfamic acid, acetic acid, citric acid, diglycollic acid, oxalic acid and tartaric acid used in amount sufficient to impart to the solution a pH of from 1 to 5.

3,985,901
PREPARATION OF ACIDOPHIL MILK IN POWDER FORM

Carlos Gonzalez Barberan, Madrid, Spain, assignor to Instituto de Biologia Aplicada, S.A., Spain

Filed Nov. 11, 1974, Ser. No. 522,862
Int. Cl.² A23C *9/12, 1/04, 1/06*
U.S. Cl. 426—43 **8 Claims**

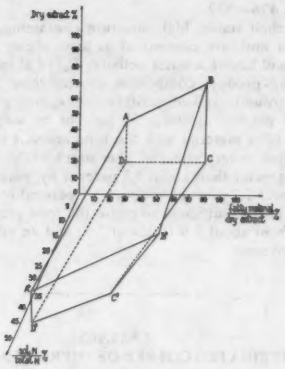
1. A process for drying and preserving acidophil fermented milk in powdered form so that it can be readily reconstituted with water, which comprises:
1. culturing a lactic acid producing microorganism in a culture medium to produce an inoculum;
2. sterilizing milk to be fermented, and adjusting the solids content of said milk to approximately 16 to 20% solids content;
3. fermenting the milk of step (2) with the inoculum of step (1) in a continuous or discontinuous manner;
4. inoculating a culture medium with the inoculum of step (1) and fermenting under conditions sufficient to obtain a large proliferation of the lactic acid producing microorganism;
5. enriching the solids content of the fermented milk of step (3) with
   a. 15 to 20% sugars or other sweeting agents and
   b. 1 to 2% thickening agents
6. homogenizing the sweetened, fermented milk of step (5) by mechanical means to destroy any gelled particles and to improve fluidity;
7. spray drying the product of step (6) at from 130° to 180°C, where the survival of lactic acid producing microorganisms is desired, or at 180° to 300°C where such survival is not necessary but increased yields are desired;
8. agglomerating the product of step (7) in a moist atmosphere and then drying it in a fluidized bed;
9. lyophilizing the lactic acid producing microorganisms from the fermentation of step (4) by rapid freezing under conditions to promote the survival of the said microorganisms and thereby produce a foamy freeze-dried mass comprising live lactic acid producing microorganisms;
10. grinding the foamy mass resulting from the lyophilization of step (9) to a granulometry similar to that of the product of step (8);
11. mixing the lyophilized product of step (10) with an excipient so as to achieve a lactic acid microorganism content in the lyohilized product of 10^{10} microorganisms per gram;
12. mixing the lyophilized product of step 11) with thhe product of step 8) in a proportion of approximately 40 parts by weight of the product of step (8) and 2 parts by weight of the product of step (11) so that when reconstituted with water in an amount of 42 grams of fermented dry milk per 100 to 125 cc of water, there is obtained a creamy, liquid, fermented acidophil milk having about 200 million lactic acid producing microorganisms per cc.

3,985,902
PROCESS FOR PREPARING A FOOD PRODUCT

Gilbert Coste, Annecy-le-Vieux, France, assignor to Fromageries Picon, Saint-Felix, France

Continuation-in-part of Ser. No. 316,505, Dec. 19, 1972, abandoned. This application May 31, 1974, Ser. No. 475,247
Claims priority, application France, Dec. 22, 1971, 71.46090
Int. Cl.² A23C *19/00*
U.S. Cl. 426—582 **3 Claims**

1. A process for preparing a processed cheese product in the form of a mousse without the use of jellifiers or thickeners comprising mixing a cheese composition containing cheese as the principal ingredient and polyphosphates to which is added at least one ingredient selected from the group consisting of powdered milk, cream, butter, casein and lactoserum at a temperature of 95°–100° C, cooling the mixture thus obtained and when the mixture is cooled to a temperature of 85°–75°



C, whipping the mixture in an inert gas at a pressure of 0.5 to 1.5 kg/sq.cm., the amount of polyphosphates in said mixture being 1–3% based on the processed cheese and said mixture having at 95° C, before the whipping, a viscosity of 20–50 poises and after the whipping, a viscosity of 100–140 poises.

3,985,903
PROCESS FOR TREATMENT OF FISH MEAT TO PRODUCE RAW MATERIAL FOR PRODUCTION OF POWDERED FISH MEAT RETAINING FRESH MEAT ACTIVITY

Yoshisuke Hasegawa, Hokkaido, Japan, assignor to Mitsubishi Corporation, Tokyo, Japan

Filed June 28, 1974, Ser. No. 484,345
Claims priority, application Japan, June 29, 1973, 48-72821
Int. Cl.² A23L *1/22*
U.S. Cl. 426—257 **12 Claims**

1. In a process for bleaching fish meat by mixing the fish meat with an aqueous solution and then separatng the aqueous solution from the fish meat as a waste liquid, the improvement comprising reducing the amount of water-soluble proteins lost in the waste liquid by using, as the aqueous bleaching solution, an aqueous solution of at least one ester of a fatty acid and a sugar and at least one salt of an alkaline earth metal, said ester being present in an amount at least 0.001% by weight based on the weight of the fish meat treated, said aqueous solution having a pH near the isoelectric point of the protein in the fish meat.

12. A process for the manufacture of a fish meat powder wherein water-soluble proteins are retained in the fish meat powder, said process comprising:

bleaching fish meat with an aqueous bleaching solution of at least one ester of a fatty acid and a sugar and at least one salt of an alkaline earth metal, said ester being present in the bleach solution in an amount at least 0.001% by weight based on the weight of fish meat treated, and said solution having a pH value near the isoelectric point of the protein in the fish meat;

separating said fish meat from said aqueous bleaching solution; and

forming a sol of said fish meat in the presence of a sugar and a fatty acid ester thereof;

adjusting the pH of the sol to a value near the isoelectric point of the protein in the fish meat; and

spray-drying said sol to form the fish meat powder.

3,985,904

SHELF STABLE, HIGH MOISTURE, MEAT-CONTAINING FOOD PRODUCT

John W. Bernotavicz, Barrington, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Mar. 25, 1974, Ser. No. 454,212
Int. Cl.[2] A23K *1/10;* A23L *1/31*
U.S. Cl. 426—332 27 Claims

1. A shelf stable, high moisture containing, food product having a moisture content of at least about 50 percent by weight and having a water activity, A_w, of at least about 0.90, said food product comprising greater than 50 percent by weight ground, cooked, proteinaceous, meaty material; from about 1 percent to about 35 percent by weight gelatinized starchy filler material with the total amount of cooked, proteinaceous, meaty material plus starchy filler material comprising greater than about 85 percent by weight of the food; from about 1.7 percent to about 3.8 percent by weight edible, non-toxic acid sufficient to cause the food product to have a pH of from about 3.9 to about 5.5; and an effective amount of antimycotic.

3,985,905

DECAFFEINATED COFFEE OF IMPROVED AROMA AND FLAVOR

Richard P. Scelia, Tarrytown; Kenneth W. Fagan, Bronx, both of N.Y., and Michael G. Protomastro, Woodridge, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 315,375, Dec. 15, 1972, abandoned. This application June 24, 1974, Ser. No. 482,281
Int. Cl.[2] A23F *1/08*
U.S. Cl. 426—427 6 Claims

1. A process for producing decaffeinated coffee material having an aroma and flavor more nearly like undecaffeinated coffee, comprising the steps of:

a. washing caffeine-containing green coffee material with water to remove loosely-held surface constituents therefrom and to form an aqueous solution of said constituents, said washing being performed at temperatures from about 40° F to about 80° F at atmospheric pressure for about 3 to 15 minutes whereby relatively insignificant amounts of both caffeine and other green coffee solubles are removed from said caffeine containing green coffee material, tne ratio of water to caffeine-containing coffee material being at least 2:1 by weight;

b. separating said coffee material from said aqueous solution; and

c. contacting a decaffeinated coffee material with said aqueous solution of coffee constituents.

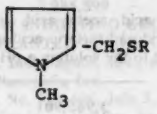
3,985,906

FLAVORING AGENT

Max Winter, Petit-Lancy; Fritz Gautschi, Commugny; Ivon Flament; Max Stoll, both of Petit-Lancy, all of Switzerland, and Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 482,820, June 24, 1974, abandoned, which is a division of Ser. No. 243,866, April 13, 1972, abandoned, which is a division of Ser. No. 70,560, Sept. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, April 30, 1965, abandoned. This application June 6, 1975, Ser. No. 584,689
Int. Cl.[2] A23L *1/234*
U.S. Cl. 426—535 20 Claims

1. As a new composition of matter a soluble coffee material having added thereto a minor, but flavor modifying amount of a compound selected from the group of compounds having the general formula:



wherein R is a methyl, ethyl, furfuryl or acetyl group.

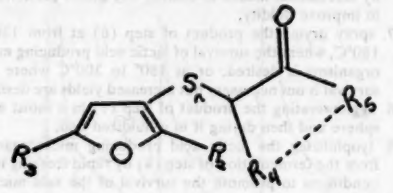
3,985,907

NOVEL 3-FURYL BETA OXOALKYL SULFIDES, PROCESSES FOR PRODUCING SAME AND METHODS FOR USING SAME FOR ALTERING THE ORGANOLEPTIC PROPERTIES OF FOODSTUFFS

William J. Evers, Middletown; Howard H. Heinsohn, Jr., Hazlet; Manfred Hugo Vock, Locust, and Christopher Giacino, Califon, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

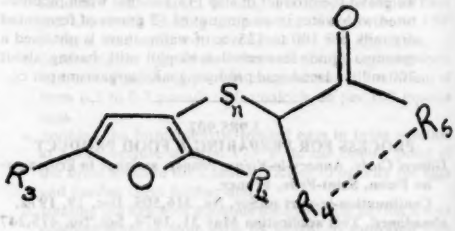
Filed May 29, 1975, Ser. No. 581,894
Int. Cl.[2] A23L *1/231*
U.S. Cl. 426—535 27 Claims

1. A 3-furyl beta-oxoalkyl sulfide having the structure:



wherein n is 1 or 2; R_2 and R_3 are each selected from the group consisting of methyl and hydrogen, at least one of R_2 and R_3 being methyl; and R_4 and R_5 taken separately, are each lower alkyl, or R_4 and R_5 taken together complete a cycloalkyl ring, or bicycloalkyl ring.

10. A process for augmenting or enhancing the meaty flavor of a foodstuff comprising the step of adding to said foodstuff from about 0.005 ppm up to about 250 ppm of a 3-furyl beta oxoalkyl sulfide compound having the structure:

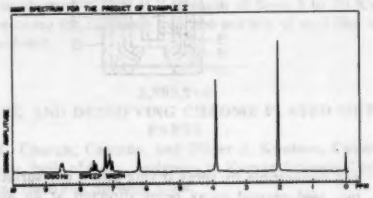


wherein n is one or two; R_2 and R_3 are each selected from the group consisting of methyl and hydrogen, at least one of R_2 and R_3 being methyl; and R_4 and R_5 taken separately, are each lower alkyl, or R_4 and R_5 taken together complete a cycloalkyl or bicycloalkyl ring.

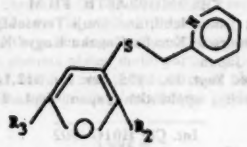
3,985,908
3-FURYL SULFIDES AND FOODSTUFF FLAVOR COMPOSITIONS COMPRISING SAME

William J. Evers, Middletown; Howard H. Heinsohn, Jr., Hazlet; Manfred Hugo Vock, Locust, and Christopher Giacino, Califon, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 581,962, May 29, 1975. This application Mar. 12, 1976, Ser. No. 666,351
Int. Cl.² A23L *1/226, 1/231*
U.S. Cl. 426—535 8 Claims



1. A 3-furyl sulfide having the structure:



wherein R_2 and R_3 are each selected from the group consisting of methyl and hydrogen, at least one of R_2 and R_3 being methyl.

3,985,909
INCORPORATING A GAS IN CANDY

Paul A. Kirkpatrick, New Rochelle, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,527
Int. Cl.² A23G *3/00*
U.S. Cl. 426—572 6 Claims

1. A method of incorporating a gas in a candy glass which comprises:

a. a candy melt,

b. introducing the melt in to a pressure vessel within which a shaft is rotatably mounted along the vertical axis of said vessel, said shaft having mixing means attached to it, said shaft having a hollow interior connecting sidewall openings in its top portion and bottom portion such that the level of the melt covers at least part of the mixing means and the bottom opening of said shaft,

c. introducing a gas into the vessel at superatmospheric pressure in the headspace area above the melt so that the gas enters the shaft at the top opening and exits at the bottom opening so that the gas is dispersed within the melt by the mixing means,

d. isolating the pressure vessel from the gas supply, and

e. allowing the melt to cool to room temperature and solidify.

3,985,910
METHOD OF MAKING A GASIFIED CONFECTION

Paul A. Kirkpatrick, New Rochelle, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,603
Int. Cl.² A23G *3/00*
U.S. Cl. 426—572 9 Claims

1. A method of making a carbonated candy which comprises:

a. obtaining a hot candy melt,

b. introducing the hot melt into a first pressure vessel,

c. introducing a gas at superatmospheric pressure into the first pressure vessel so that the gas is dispersed within the hot melt,

d. introducing a gas at superatmospheric pressure into a second pressure vessel at a value equivalent to the pressure within the first pressure vessel, the first and second pressure vessels having a connecting line with valve means between the bottom of the first vessel and the bottom of the second vessel,

e. transferring the gasified hot melt to the second pressure vessel through the connecting line by opening said valve means and then creating a pressure differential between the two vessels, said differential being effected by regulating the superatmospheric pressure in the second pressure vessel at a value lower than the superatmospheric pressure in the first pressure vessel and venting the top of the second pressure vessel,

f. isolating the second pressure vessel while continuing to maintain a superatmospheric pressure,

g. cooling the second pressure vessel so that the gasified hot melt becomes a gas-containing solid matrix,

h. shock-treating the second pressure vessel so that the gas-containing solid matrix is shattered into multiple fragments,

i. venting the second pressure vessel, and

j. opening the second pressure vessel to allow the product to be removed.

3,985,9[illegible]
PASTRY SHORTENING

Edward F. Kriz, Berwyn, Ill., and Antal G. Oszlanyi, North Olmsted, Ohio, assignors to SCM Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 206,951, Dec. 10, 1971, abandoned. This application Feb. 4, 1974, Ser. No. 439,367
Int. Cl.² A23D *5/02*
U.S. Cl. 426—602 5 Claims

1. The process for forming a shortening composition which is functional in pastry preparation when blended into dough in the temperature range between about 50° to 90° F., said shortening being untempered and made from liquefied shortening mixture selected from vegetable fat, or vegetable and animal fats, and from 0 to 15 parts of water per 100 parts of said liquefied mixture, said shortening composition having beta-prime crystalline stability, a Wiley Melting Point in the range of 110° to 120° F., and an SFI profile within the following range:

Temperature, °F.	SFI
50	28 to 40
70	24 to 37
80	22 to 34
92	16 to 28
100	13 to 22
110	5 to 16

said process comprising the steps of:

a. holding said liquefied shortening mixture at a temperature high enough to maintain said mixture completely liquid;

b. feeding said liquid shortening mixture to one end of an elongated scraped wall heat exchange zone wherein said completely liquid shortening is rapidly chilled with vigorous agitation in about 15 seconds to about two minutes to a temperature T_1 in the range of about 62° to 80° F. to develop a beta-prime nucleated shortening mixture;

c. passing the nucleated shortening mixture resulting in step (b) directly to a kneading and heat exchange zone at a temperature T_2 in the range of about 75° to 60° F., wherein said nucleated mixture is kneaded and cooled for a time sufficient to further develop beta-prime crystalline phase with concommittant thickening while maintaining an extrudable plastic shortening mass;

d. extruding the resulting extrudable plastic shortening mass at a temperature in the range of about 62° to 77° F. directly into user packages as finished shortening.

3,985,912

SOLIDIFIED PRODUCT FROM MOLASSES AND WHEAT FLOUR

Elmer F. Glabe, Northbrook; Perry W. Anderson, Niles, and Stergios Laftsidis, Chicago, all of Ill., assignors to Food Technology, Inc., Chicago, Ill.

Filed Dec. 31, 1975, Ser. No. 645,538

Int. Cl.² A23L 1/09

U.S. Cl. 426—622 **4 Claims**

1. A dehydrated molasses consisting essentially of the following ingredients:

Ingredients	Parts by Weight
Molasses solids	40–75
Wheat flour	55–20
At least partially defatted soy protein flour having a protein content of at least 45% by weight, a water soluble protein content of at least 20% by weight of the total protein content, and a weight ratio of water soluble protein to fat content of at least 1.5:1	0–5
Water	0.5–5.0
Emulsifier	0–1
Anti-humectant	0–1

3,985,913

CONDIMENT ENCAPSULATION BY SPRAY DRYING

Lawrence A. Johnson, Medina, Ohio, and Edgar J. Beyn, Annapolis, Md., assignors to SCM Corporation, New York, N.Y.

Filed July 31, 1974, Ser. No. 493,325

The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.

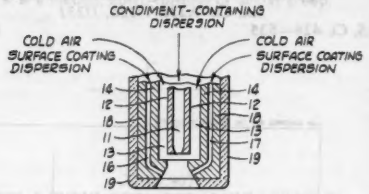
Int. Cl.² A23L 1/22

U.S. Cl. 426—650 **4 Claims**

1. A process for producing condiment particles by spray drying in a heating zone which comprises:

forming a first spray of said condiment dispersed in normally solid lipoidal material in fluent state, said forming of said first spray being assisted with a flow of cold gas;

intercepting said first spray with a second spray of an edible surface coating material dispersed in a fugitive carrier



and convertible by spray drying into a dry surface coating, said second spray being directed at an angle for coating said first spray with said second spray; and

drying the resulting composite particles in said heating zone.

3,985,914

METHOD FOR CONTINUOUSLY POLARIZING THERMOPLASTIC FILM

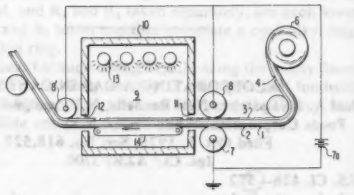
Tohru Sasaki; Takao Ichii, and Shuji Terasaki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 10, 1975, Ser. No. 612,144

Claims priority, application Japan, Sept. 11, 1974, 49-103863

Int. Cl.² H01G 7/02

U.S. Cl. 427—12 **8 Claims**



1. In a method for continuously polarizing thermoplastic film wherein a long thermoplastic film having electrically conductive layers deposited on both surfaces of the film is continuously passed through a polarizing zone, and a D.C. electric field is applied across the electrically conductive layers thereby to polarize the thermoplastic film passing through the zone at a polarizing temperature higher than 50° C and lower than the softening point of the film, the improvement comprising the step of forming at least one of the electrically conductive layers into a plurality of sections separated by narrow insulating regions disposed approximately at right angles to the longitudinal dimension of the thermoplastic film and extending transversely across the width thereof.

3,985,915

USE OF NITROCELLULOSE CONTAINING 10.5 TO 12% NITROGEN AS ELECTRON BEAM POSITIVE RESISTS

Edward Gipstein, Saratoga, Calif.; Wayne M. Moreau, Wappingers Falls, N.Y., and Omar U. Need, III, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,542
Int. Cl.[2] B05D 3/06
U.S. Cl. 427—43 2 Claims

1. A process for forming an image with a positive resist, said process comprising the steps of:
1. forming on a substrate a film comprising nitrocellulose containing from 10.5 to 12% nitrogen,
2. exposing said film in a predetermined pattern to radiation with electron beams at a strength of from 5 to 30 KV,
3. removing the radiation exposed portion of said film with a solvent.

3,985,916

SEALING AND DENSIFYING CHROME PLATED METAL PARTS

Peter K. Church, Cascade, and Oliver J. Knutson, Colorado Springs, both of Colo., assignors to Kaman Sciences Corporation, Colorado Springs, Colo.

Continuation-in-part of Ser. No. 7,948, Feb. 2, 1970, which is a division of Ser. No. 694,303, Dec. 28, 1967, Pat. No. 3,789,096. This application Oct. 23, 1975, Ser. No. 625,167
Int. Cl.[2] B05D 3/02
U.S. Cl. 427—46 4 Claims

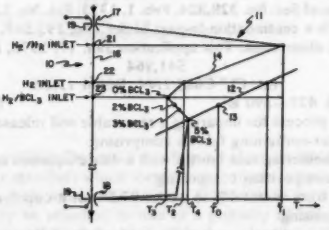
1. A method of treating metal parts having chrome plating thereon wherein said chrome plating contains pores and cracks comprising the steps of:
applying a chromic acid solution having a specific gravity of from 1.64–1.66 to said chrome plated metal parts to penetrate the pores and cracks of the chrome plating; and
heating the chrome plated metal parts to at least 600° F but below the vitrification temperature of chrome oxide to convert the chromic acid to chrome oxide.

3,985,917

METHOD OF DEPOSITING MATERIAL ON A HEATED SUBSTRATE

Val J. Krukonis, Lexington, Mass., assignor to Avco Corporation, Cincinnati, Ohio

Continuation of Ser. No. 231,358, March 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 4,692, Jan. 21, 1970, abandoned. This application Feb. 11, 1974, Ser. No. 440,092
Int. Cl.[2] B05D 3/14, 5/12
U.S. Cl. 427—52 10 Claims



1. In a method for coating electrically conducting filaments by drawing the filament continuously through an enclosed reaction chamber containing vapors taken from the class consisting essentially of boron halides to produce boron deposit, hydrocarbon substituted chlorosilanes to produce a silicon carbide deposit, a mixture of boron carbide, boron trichloride and hydrogen to form a boron carbide deposit or a mixture of titanium tetrachloride, boron trichloride and hydrogen to form a titanium diboride deposit, said foregoing materials being reactable on contact with a hot surface of the filament to form the desired coating material, the filament being positioned between a single pair of electrodes the improvement comprising passing an electric current through the filament to heat it to a cleaning temperature in excess of that normally used to cause the chemical vapors to react on contact with the surface to form a coating on the surface, exposing a hot surface segment of said filament to a reducing atmosphere for cleaning said filament;
cooling said cleaned surface segment below the reaction temperature in a non-reactive atmosphere;
moving said cooled surface segment gradually into contact with the reactable vapors and simultaneously heating said surface segment so as to effect gradual increase in reactable vapor concentration and temperature said surface segment reaching said reaction temperature only after said surface segment is exposed to an atmosphere containing at least a specified proportion of reactable vapors.

3,985,918

METHOD FOR MANUFACTURING A TARGET FOR AN IMAGE PICKUP TUBE

Masakazu Fukai, Nishinomiya; Shinji Fujiwara, Toyonaka; Hiroyuki Serizawa, Katano; Osamaru Eguchi, Higashi-Osaka, and Yukimasa Kuramoto, Takarazuka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 405,172, Oct. 10, 1973, abandoned. This application Jan. 23, 1975, Ser. No. 543,550
Claims priority, application Japan, Oct. 12, 1972, 47-102516; Dec. 5, 1972, 47-122722; Dec. 5, 1972, 47-122723; Dec. 5, 1972, 47-122724; Dec. 5, 1972, 47-122725
Int. Cl.[2] B05D 5/12, 3/02
U.S. Cl. 427—76 6 Claims

1. A method for manufacturing a target for an image pickup tube comprising the steps of:
depositing by evaporation a first layer consisting of ZnS_xSe_{1-x} or $Zn_uCd_{1-u}S$, wherein $0 \leq x \leq 1$ and $0 \leq u \leq 1$, on a light transmitting substrate having a transparent conductive film thereon, the coeffficient of linear expansion of said light transmitting substrate being within the range 56×10^{-7}/° C to 110×10^{-7}/° C,
depositing by evaporation a second layer consisting of $(Zn_yCd_{1-y}Te)_z(In_2Te_3)_{1-z}$, wherein $0.1 \leq y \leq 0.9$ and $0.7 \leq z \leq 1$ on said first layer, and
heat treating said light transmitting substrate formed with said first and second layers in an inert gas atmosphere or under vacuum at 350°–650° C.

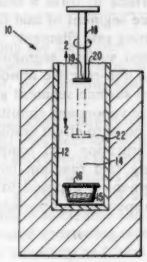
5. A method for manufacturing a target for an image pickup tube comprising the steps of:
depositing by evaporation a first layer consisting of ZnS_xSe_{1-x} or $Zn_uCd_{1-u}S$, wherein $0 \leq x \leq 1$ and $0 \leq u \leq 1$, on a light transmitting substrate having a transparent conductive film thereon,
depositing by evaporation a second layer consisting of $(Zn_yCd_{1-y}Te)_z(In_2Te_3)_{1-z}$, wherein $0.1 \leq y \leq 0.9$ and $0.7 \leq z \leq 1$, on said first layer,
initially heat treating said light transmitting substrate formed with said first and second layers in an inert gas atmosphere or under vacuum at 350°–650° C, and
secondly heat treating said light transmitting substrate at a temperature between 150° and 400° C which is lower than that of the initial heat treatment for a period within a range of 20 minutes to 3 hours.

3,985,919

VAPOR DEPOSITION OF CERMET LAYERS

Harry Louis Pinch, Princeton, and Stephen Thomas Opresko, Hightstown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,389
Int. Cl.² C23C *17/02, 11/00*
U.S. Cl. 427—101 **12 Claims**



1. A method of forming a cermet region in a refractory insulating substrate comprising the steps of:

reacting a metal oxide vapor with said substrate at a sufficient temperature and for a sufficient time such that said metal oxide vapor diffuses into said substrate, said metal oxide being selected from the group consisting of tungsten oxide and molybdenum oxide, and then

subjecting said reacted substrate to a reducing atmosphere at a temperature between about 600° C to about 1200° C for a sufficient time so as to reduce at least some of said metal oxide which diffused into said substrate without reducing said substrate.

3,985,920

ADHESIVE COATING OF VINYL POLYMERS AND COPOLYMERS AND METHOD OF MAKING SAME

David Travis, Lumberton, N.J., assignor to Sybron Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 281,789, Aug. 18, 1972, Pat. No. 3,874,914. This application Aug. 12, 1974, Ser. No. 496,649
Claims priority, application Canada, Dec. 10, 1973, 187786
The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.
Int. Cl.² B44D *1/02*
U.S. Cl. 427—207 A **9 Claims**

1. A process for promoting the adhesion of a vinyl resin to a substrate comprising preparing an anhydrous coating composition consisting essentially of the vinyl resin and about 0.5 to 5.0 percent by weight based upon the weight of the vinyl resin of a polyfunctional carboxylic aziridinyl ester selected from the group consisting of trimethylol propane tris (2-aziridinyl propionate), trimethylol propane tris (2-aziridinyl butyrate), pentaerythritol tris-3-(1-aziridinyl propionate), and pentaerythritol tetra-3-(1-aziridinyl propionate); and applying said composition to the substrate.

3,985,921

TREATMENT OF WOOD WITH BUTYLENE OXIDE

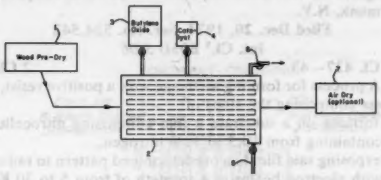
Roger M. Rowell, and David I. Gutzmer, both of Madison, Wis., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 18, 1975, Ser. No. 587,923
Int. Cl.² B05D *3/02, 3/12*
U.S. Cl. 427—317 **10 Claims**

1. A process of treating cellulosic materials comprising:

a. drying the cellulosic materials to be treated;

b. treating the dried cellulosic material with a solution of butylene oxide and a tertiary amine under elevated temperature and pressure, said butylene oxide and said tertiary amine being present in amounts sufficient to impart increased rot resistance and improved dimensional stability to said dried cellulosic material;



c. draining the standing reagent; and

d. removing the remaining excess reagent.

3,985,922

PROCESS FOR WASHING PAINT OVERSPRAY FROM AIR

Robert H. Thornton, Bellevue, and Bryce Chambers, Seattle, both of Wash., assignors to InVireChem. Inc., Seattle, Wash.

Filed Aug. 12, 1971, Ser. No. 171,386
Int. Cl.² B05D *1/40, 3/12*
U.S. Cl. 427—345 **6 Claims**

1. A process for washing paint overspray from air comprising contacting said overspray with an aqueous solution comprising at least 0.004% by weight of a first component selected from the group consisting of water soluble salts of polyaminopolycarboxylic acids, water soluble salts of nitrilotriacetic acid, and mixtures thereof; a second component selected from the group consisting of sodium hydroxide, potassium hydroxide and mixtures thereof, the amount of said second component being such that said solution has a pH of at least 10; and at least 0.006% by weight of a third component selected from the group consisting of triethanolamine, water soluble salts of oxalic acid, tartaric acid, citric acid, gluconic acid and glucoheptonic acid, and mixtures thereof; whereby said overspray becomes entrained in said solution and dispersed therein.

3,985,923

PROCESS FOR IMPARTING RENEWABLE SOIL RELEASE FINISH TO POLYESTER-CONTAINING FABRICS

Marino S. Basadur, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 328,824, Feb. 1, 1973, Pat. No. 3,893,929, which is a continuation-in-part of Ser. No. 193,569, Oct. 28, 1971, abandoned. This application Jan. 17, 1975, Ser. No. 541,964
Int. Cl.² C08J *1/44;* **D06M** *13/20*
U.S. Cl. 427—390 E **11 Claims**

1. A process for imparting a renewable soil release finish to polyester-containing fabrics comprising:

A. contacting said fabrics with a dilute aqueous solution of a composition comprising:

a. from about 5% to about 97.5% of a copolymer comprising:

1. a dibasic carboxylic acid of the following general formula

HOOC—A—COOH

wherein A is a bivalent organic radical selected from the group consisting of alkylene, arylene, aralkylene, alkarylene and cycloalkylene radicals having from 3 to about 14 carbon atoms; and

2. a glycolic compound which is a polyglycol selected from the group consisting of compounds of the following general formula

$$H[-O-B-]_nOH$$

wherein B is a bivalent organic radical selected from the group consisting of alkylene and cycloalkylene radicals having from 2 to about 4 carbon atoms, and wherein n indicates the degree of polymerization and ranges from about 6 to about 500, and wherein the ratio of dicarboxylic acid to total glycolic compounds is 1:1 and the the average molecular weight is from about about 1,000 to about 100,000; and

b. from about 2.5% to 95% of a water soluble acidic compound;

said copolymer being present in said aqueous solution at a concentration of from about 0.001% to about 1.0% by weight and said aqueous solution being substantially free of synthetic acid emulsion polymers and substances which are capable of causing the swelling of polyester fibers; and

B. drying said fabrics.

3,985,924

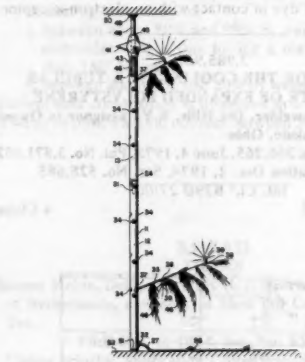
ARTIFICIAL CHRISTMAS TREE

Mike Pritza, Rock Springs, Wyo., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 17, 1975, Ser. No. 558,850

Int. Cl.² A47G *29/00*, *33/08*, *33/16*; F21P *1/02*

U.S. Cl. 428—9 **2 Claims**



1. An artificial Christmas tree formed of attachable sections of tubular members which form the tree trunk and attachable sections, each attachable section shaped as a tree branch which may be attached to one of a plurality of radial holes fitted in the tubular members, with

a spring-biased plunger slidably mounted in an axial hole in the upper end of the top-most tubular member to rest against the ceiling surface when the base section of the lowermost member rests against a horizontal supporting surface, together with

a decorative star-shaped ornament fitted with a through axial hole that mounts about the said upper end of the top-most tubular member.

3,985,925

COMPOSITE FLOOR COVERINGS

Michel S. M. Lefebvre, and Joseph Davidovits, both of Saint-Quentin, France, assignors to Omnium de Prospective Industrielle, San-Quentin, France

Continuation of Ser. No. 432,414, Jan. 10, 1974, abandoned, which is a continuation of Ser. No. 199,358, Nov. 16, 1971, abandoned. This application Mar. 25, 1975, Ser. No. 561,699

Claims priority, application France, Nov. 27, 1970, 70.42866

Int. Cl.² B32B *7/02*

U.S. Cl. 428—92 **4 Claims**

1. A composite floor covering article comprising a light woven fabric which constitutes the visible face of the article and a cellular expanded plastic foam underlayer, the underlayer being fixed to the fabric on the first surface of the underlayer and having its highest density at said first surface of the underlayer and a decreasing density through its thickness toward the other surface, the fabric not comprising any portion of the underlayer and the underlayer being constituted by at least two separate and distinct layers of different densities adhered to each other by an adhesive.

3,985,926

FLAME-RETARDANT CARPET

Judd Leonard Schwartz, Chester, and Richard Eugene Mayer, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Aug. 27, 1975, Ser. No. 608,127

Int. Cl.² B32B *3/02*, *33/00*

U.S. Cl. 428—97 **10 Claims**

1. A flame-retardant, pile carpet having a relatively pliable primary backing and a tufted surface, said surface being comprised of fibers selected from the group consisting of polyester and polyamide fibers having incorporated therein from 1 to 15 percent by weight of a zinc compound selected from the group consisting of zinc oxide and zinc hydroxide, said fibers being bonded to said backing with a bonding substance comprising an ethylene-vinyl chloride copolymer latex material and a hydrate material selected from the group consisting of aluminum hydroxide and hydrated aluminum oxide, the ratio by weight of said latex material to said hydrate material being within the range 1:2 to 1:4.5.

3,985,927

COMPOSITIONS AND METHOD FOR PRODUCING A CHEMICAL WATERMARK ON FINISHED PAPER PRODUCTS

Terry O. Norris; Rolland A. Aubey, both of Port Edwards, and John E. Haug, Rhinelander, all of Wis., assignors to Nekoosa Edwards Paper Company, Inc., Port Edwards, Wis.

Filed Feb. 24, 1975, Ser. No. 552,153

Int. Cl.² B41M *7/00*; D21H *1/48*, *5/00*

U.S. Cl. 428—211 **16 Claims**

1. A chemically watermarked product comprising a paper sheet having a watermark of preselected design applied to a portion thereof, said watermark having a refractive index approximating that of the paper and being an insoluble reaction product produced by irradiation of a synthetic resin with high frequency radiation above the visible spectrum.

8. The method of applying a chemical watermark to paper which comprises applying to the surface of a finished paper a synthetic resin composition having a chemical grouping thereon capable of being insolubilized upon exposure to high frequency radiation, said resin composition being applied in the form of a preselected design in a preselected small area of the paper, said resin composition having a viscosity suitable for such coating and being insufficiently cross-linked to be chemically set, and thereafter exposing said resin composition to high frequency radiation above the visible spectrum to thereby insolubilize said resin composition.

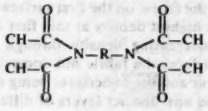
3,985,928

HEAT-RESISTANT LAMINATING RESIN COMPOSITION AND METHOD FOR USING SAME

Tsutomu Watanabe, and Sigenori Yamaoka, both of Yokohama, Japan, assignors to Sumitomo Bakelite Company, Limited, Tokyo, Japan

Filed Apr. 28, 1975, Ser. No. 572,451
Claims priority, application Japan, June 3, 1974, 49-61855
Int. Cl.[2] C09J 7/00
U.S. Cl. 428—273 25 Claims

1. A heat-resistant laminating resin composition consisting essentially of 100 parts by weight of a polyaminobismaleimide obtained by reacting at least one N,N'-bismaleimide represented by the general formula [I],



[I]

wherein R represents an aliphatic, cycloaliphatic, or aromatic divalent radical, with at least one diamine selected from the group consisting of aliphatic diamines, cycloaliphatic diamines, and aromatic diamines, 10 to 300 parts by weight of a polyepoxy compound having in the molecule at least two epoxy groups, and 5 to 150 parts by weight of at least one copolymer selected from the group consisting of (A) copolymers of aromatic vinyl compounds and maleic anhydride, (B) partial alkyl esters of said copolymers (A), (C) copolymers of aromatic vinyl compounds and alkyl maleates, and (D) copolymers of aromatic vinyl compounds, maleic anhydride, and alkyl maleates.

10. A method for preparing a heat-resistant laminating resin prepreg, which is characterized by impregnating a fibrous insulating base material with a varnish obtained by dissolving the resin composition according to claim 1 in an inert solvent, heating the impregnated base material to dryness to alloy the resin composition to react the B-stage.

12. A method for manufacturing a metal-clad heat-resistant resin laminate, which comprises applying simultaneously heat and pressure to one sheet of or a stack of several tens of superposed sheets of the prepreg obtained by the method according to claim 10, said stack having been overlaid with a metal foil.

3,985,929

FABRIC FOR USE IN MAKING FOOTWEAR

Wulf von Bonin, and Helmut Streigler, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 1, 1974, Ser. No. 520,190
Claims priority, application Germany, Nov. 7, 1973, 2355537
Int. Cl.[2] B32B 27/00
U.S. Cl. 428—290 8 Claims

1. A process for the production of hydrophilic non-woven fabric adapted to be a base material for synthetic leather which comprises impregnating a non-woven fabric with a polymer and optionally a cross-linking agent, said polymer having been produced by polymerization of ethylenically unsaturated monomers including acrylic acid or methacrylic acid in the presence of polyethylene oxide, drying the resulting impregnated fabric, and optionally heating to cross-link the polymer.

8. The process of claim 1, wherein the polymer is produced by polymerization of acrylic acid or methacrylic acid with an ethylenically unsaturated monomer in the presence of polyethylene oxide.

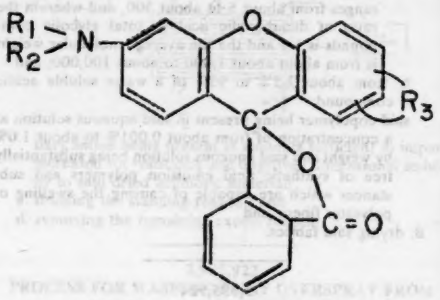
3,985,930

CYCLOPOLYMETHYLENEFLUORAN COMPOUNDS

Dale Richard Shackle, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 4, 1976, Ser. No. 663,963
Int. Cl.[2] B41L 1/20
U.S. Cl. 428—307 6 Claims

1. A fluoran compound represented by the general formula



wherein R_1 and R_2 each represent a lower alkyl group containing one to four carbon atoms and wherein R_3 is a cyclopolymethylene group containing from three to four carbon atoms.

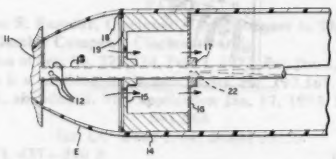
4. A pressure-sensitive transfer sheet comprising a substrate having coated thereon pressure rupturable microcapsules containing an organic solvent solution of the substantially colorless cyclopolymethylenefluoran compound of claim 1, said organic solvent solution of said substantially colorless cyclopolymethylenefluoran compounds being capable of forming a colored dye in contact with an electron-acceptor.

3,985,931

METHOD FOR THE COOLING OF A TUBULAR EXTRUDATE OF EXPANDED POLYSTYRENE

Maurice W. Blackwelder, Dix Hills, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 366,265, June 4, 1973, Pat. No. 3,871,802.
This application Dec. 2, 1974, Ser. No. 528,685
Int. Cl.[2] B29D 27/00
U.S. Cl. 428—315 4 Claims



1. The method for producing a web of polystyrene comprising the steps of; extruding a warm circular extrudate of a blowing agent-containing polystyrene composition; quickly chilling the inside surface of the extrudate by directing a fluid thereagainst to inhibit expansion of the extrudate in the portions thereof near such surface; moving the extrudate through a substantial distance to allow other portions thereof to expand due to expansion of the blowing agent therein; enlarging the diameter of the extrudate; passing the fully enlarged extrudate over a cooled mandrel in tight surface to surface contact therewith for a substantial axial distance after said other portions have expanded to size said extrudate and to cool it sufficiently to inhibit further expansion thereof; passing

the fully enlarged extrudate in surface to surface contact for a relatively short axial distance over a surface contacting ring shortly before said extrudate contacts said mandrel to treat the mandrel contacting surface of the extrudate to substantially prevent adherence of particles of the extrudate onto the mandrel, and to thereby protect other portions of the mandrel contacting surface of the extrudate from being damaged by contact with particles adhered to the mandrel; and severing the extrudate along at least one longitudinally extending line to form at least one web therefrom.

4. A web of expanded polystyrene, comprised mainly of a general purpose grade of polystyrene, said web having a relatively dense, printable skin, said web having been produced by the method of claim 1, said skin being the mandrel contacting side of the extrudate from which said web is severed.

3,985,932

PAPER COATING DISPERSIONS AND PROCESS

Rotheus Byram Porter, Darien, Conn., assignor to Moore and Munger, Stamford, Conn.

Filed Aug. 5, 1974, Ser. No. 494,747

Int. Cl.² B32B *29/00*; **D21H** *1/28*, *1/36*; **B32B** *5/16*

U.S. Cl. 428—326 **15 Claims**

1. In a publication paper coating for use in the manufacture of publication paper to enhance the ink receptivity of the paper, a dispersion composition comprising:

A. between about 70 and 95 percent by weight of clay;

B. between about 5 and 20 percent by weight of a binder selected from the group consisting of starch and latex;

C. between about 0.1 and 2 percent by weight of a dispersing agent;

D. between about 0.1 and 5 percent by weight of a lubricant consisting essentially of

a. between about 80% and 99% by weight of a hard, high molecular weight wax having a melting point greater than 180° F.; and

b. between about one and 20% by weight of a surfactant, wherein said composition is dispersed in a sufficient quantity of water to obtain a solid content between 50 and 75 percent.

3,985,933

FIBERS

Hemant Mehta, Delft, and Willy H. J. Badrian, Voorburg, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 6, 1974, Ser. No. 530,103

Claims priority, application United Kingdom, Dec. 6, 1973, 56577/73; Dec. 6, 1973, 56578/73

Int. Cl.² B32B *25/16*

U.S. Cl. 428—357 **10 Claims**

1. Improved fibrillated polypropylene fibers from film, having better hand, gloss, resilience, dyeability and denier control, comprising fibers made by fibrillating an oriented film of no more than about 1 mil thickness, made by heat stretching at an elevated temperature but below its melting point a film comprised of from about 70 to about 99.5 weight percent polypropylene and from about 30 to about 0.5 weight percent of a rubber selected from the group consisting of polybutadiene and polybutadiene/polystyrene block copolymer where said polybutadiene has a cis 1,4 content of at least about 90 percent and said polybutadiene/polystyrene block copolymer has a polystyrene content of from about 50 to about 10 weight percent and the polybutadiene block has a cis 1-4 content of at least about 35 percent and 1-2 content of less than about 20 percent.

3,985,934

POLYIMIDE FIBER HAVING A SERRATED SURFACE AND A PROCESS OF PRODUCING SAME

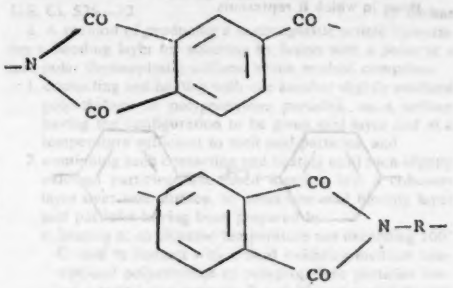
William J. Farrissey, Jr., Northford, and Besir K. Onder, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 492,321, July 26, 1974, abandoned, and a continuation-in-part of Ser. No. 492,595, July 26, 1974, abandoned, which is a division of Ser. No. 405,777, Oct. 12, 1973, abandoned. This application May 8, 1975, Ser. No. 575,658

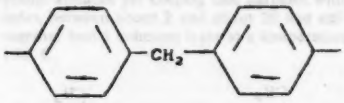
Int. Cl.² D01D *5/06*, *5/12*, *5/24*; **D01F** *1/08*, *6/74*

U.S. Cl. 428—397 **8 Claims**

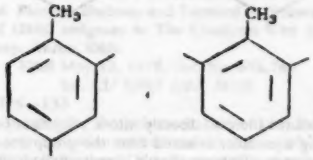
1. A filament characterized by a serrated and interrupted annular cross-section said filament comprising a copolyimide having the structure



wherein from 10 to 30 percent of said recurring units are those in which R represents



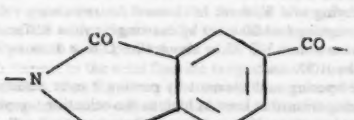
and the remainder of said units are those in which R represents a member selected from the group consisting of

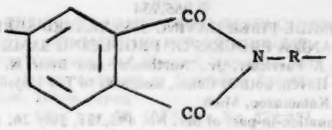


and mixtures thereof.

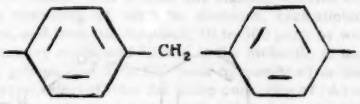
3. A process for the production of copolyimide filaments characterized by a serrated and interrupted annular cross-section comprising the steps of:

a. forming a copolyimide filament by spinning a dipolar aprotic solvent solution of a copolyimide having the structure

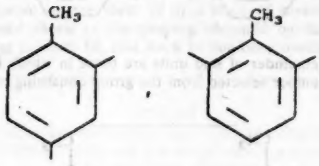




wherein from 10 to 30 percent of said recurring units are those in which R represents



and the remainder of said units are those in which R represents a member selected from the group consisting of



and mixtures thereof, directly into a coagulant bath comprising a member selected from the group consisting of lower monoalkylene glycols, lower dialkylene glycols, glycerine, and solutions thereof with water;

b. passing said filament through at least one aqueous bath containing from about 0.5 percent to about 2.0 percent of a surfactant;

c. removing at least 75 percent of the volatiles from said washed filament by passing it over at least one roller heated to a temperature from about 100° C to about 220° C while drawing it to a total draw ratio from about 1X to about 3X;

d. drying said filament to remove the remaining volatiles;

e. orienting said filament by drawing it over a surface heated from about 325° C to about 400° C to a draw ratio up to about 5X and;

f. tempering said filament by passing it over a surface at a temperature at least as high as the orienting temperature, said surface being disposed between two rollers, and allowing the filament to relax.

3,985,935

ALKALI RESISTANT PERLITE - CaO VITREOUS FIBERS

Franz Josef Brodmann, Philadelphia, Pa., assignor to General Refractories Company, Bala Cynwyd, Pa.

Filed Oct. 16, 1973, Ser. No. 406,833

Int. Cl.² C07B 37/06; C07C 13/00

U.S. Cl. 428—401 2 Claims

1. An alkali resistant mineral wool fibrous materil consisting essentially of vitreous fibers having 5 to 15% CaO as the sole additive to naturally occurring perlite ore and resulting in said vitreous fibers containing from about 72 to about 74% SiO_2, from about 12 to about 13% Al_2O_3 and from about 5 to 15% of CaO, the said percentages being weight percentages based on the weight of said perlite, said fibers being characterized by a low weight percent loss in up to 100 hours in aqueous 1.0 normal sodium hydroxide solution amounting to not more than 0.75% loss at a 10% content of CaO and being further characterized in having a diameter of 2 to 5 microns and a length of about 0.5 to 3 inches.

3,985,936

PRESSURE-SENSITIVE AND/OR HEAT SENSITIVE COPYING OR RECORDING MATERIAL

Jean-Claude Petitpierre, Kaiseraugst, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

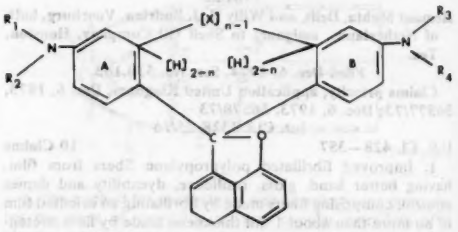
Filed Nov. 18, 1974, Ser. No. 524,700

Claims priority, application Switzerland, Jan. 29, 1974, 1186/74

Int. Cl.² B41C 1/06; B41M 5/02

U.S. Cl. 428—411 6 Claims

1. Copying or recording material consisting essentially of a substrate coated with a layer containing as its color producing material at least one furane of the formula



in which

R_1, R_2, R_3 and R_4 each are alkyl with 1 to 4 carbon atoms or aryl,

X is oxygen or sulphur and

n is 1 or 2 and the rings A and/or B are unsubstituted or additionally substituted by alkyl with 1 to 4 carbon atoms or halogen.

3,985,937

PAPERBOARD LAMINATING ADHESIVE CONTAINING POLYVINYL ACETATE/STYRENEBUTADINE POLYMERS; PARAFFIN WAX; CLAY; AND POLYALKYLENEGLYCOL

Rodger L. Fife, Cupertino, Calif., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Sept. 8, 1975, Ser. No. 610,936
Int. Cl.² B32B 9/06; C08L 3/02, 91/08
U.S. Cl. 428—486 18 Claims

1. A corrugating medium laminating adhesive which comprises a polymer latex emulsion adhesive selected from a group consisting of polyvinyl acetate homopolymers and styrenebutadiene polymers, admixed in water, based upon the polymer solids, with

a. from 10 to 30 weight percent of clay,

from 0.1 to 2 weight percent of a paraffin wax as an aqueous wax emulsion, said paraffin wax having a melting point in the range of 52° to 56° C, and

c. from 0.1 to 2 weight percent of a polyalkyleneglycol wetting agent.

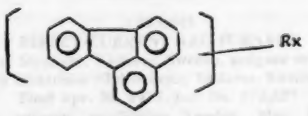
3,985,938

DIELECTRIC ETHYLENE COPOLYMER COMPOSITIONS CONTAINING ALKYLFLUORANTHENE

Masaaki Takahashi; Akira Ito, both of Tokyo; Yuriko Igarashi, Mitaka; Shichiro Kawada, Hitachi; Jiro Ogura, Hitachi, and Ryoichi Ito, Hitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 481,257, June 20, 1974, Pat. No. 3,915,945. This application Aug. 7, 1975, Ser. No. 602,804
Claims priority, application Japan, July 3, 1973, 48-74363
The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.
Int. Cl.² C08L 5/01; C08F 6/00, 210/00
U.S. Cl. 526—1 6 Claims

1. A dielectric composition comprising a copolymer of ethylene and at least one other monomer and an alkylfluoranthene of the formula



wherein R represents an alkyl group containing from 1 to 4 carbon atoms and x is an integer of 1 to 4, provided that when x is an integer of 2 or greater R may be the same or different; said alkylfluoranthene being present in an amount of at least 0.5 parts by weight per 100 parts by weight of said copolymer.

3,985,939

PROCESS FOR THE MANUFACTURE OF ANTISTATIC FIBERS AND SHEETS OF POLYACRYLONITRILE

Rolf Kleber, Neu Isenburg, and Sigurd Wetzel, Niedernberg, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 509,703, Sept. 26, 1974, abandoned. This application Sept. 9, 1975, Ser. No. 611,781
Claims priority, application Germany, Sept. 29, 1973, 2349148
Int. Cl.² C08K 5/42
U.S. Cl. 526—3 9 Claims

1. In a process for imparting permanent anti-static properties to filaments or fibers of acrylonitrile homopolymers and copolymers containing at least 60% of acrylonitrile units by incorporating an anti-static agent therein, the improvement which comprises using as an anti-static agent an alkylolamine salt of a branched alkylbenzenesulfonic acid, the alkylol radical having from 2 to 4 carbon atoms and the alkyl radical having from 9 to 20 carbon atoms.

3,985,940

METHOD TO IMPROVE ADHESIVE OF POLYOLEFIN SURFACES

Petrus Adam Inklaar, Diepenveen, Netherlands, assignor to Vasco Industries Corporation, Yonkers, N.Y.

Filed Nov. 28, 1973, Ser. No. 419,774
Claims priority, application Netherlands, Nov. 28, 1972, 7216086
Int. Cl.² C08F 8/08
U.S. Cl. 526—22 15 Claims

1. A method of producing a thermoplastic article comprising a bonding layer for adhering by fusion with a polar or a non-polar thermoplastic surface, which method comprises

1. contacting and heating with one another slightly oxidized polyethylene or polypropylene particles, on a surface having the configuration to be given said layer and at a temperature sufficient to melt said particles, and

2. continuing such contacting and heating until such slightly oxidized particles have fused together into a coherent layer over said surface, to constitute said binding layer said particles having been prepared by

a. heating at an elevated temperature not exceeding 100° C. and in contact with a fluid oxidizing medium non-oxidized polyethylene or polypropylene particles having a melt index between 2 and 20 and a particle size predominantly between .001 and 1 mm., and

b. discontinuing said heating at a stage thereof in which said particles are slightly oxidized to an extent rendering said particles adherable by fusion to polar thermoplastic surfaces yet keeping said particles with a melt index between about 2 and about 20 and still fusible together into a coherent layer at a temperature below 150° C.

3,985,941

METHOD OF POLYMERIZATION

Robert M. Pierson, Hudson, and Leonard J. Kuzma, Copley, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 12, 1975, Ser. No. 576,769
Int. Cl.² C08F 4/12, 36/06
U.S. Cl. 526—133 8 Claims

1. In a process for the polymerization of butadiene under solution polymerization conditions to form polybutadiene having a high proportion of butadiene units in the cis-1,4-configuration comprising contacting butadiene with a catalyst consisting essentially of (1) an organoaluminum compound (Al) selected from the group consisting of triisobutylaluminum and tri-n-butylaluminum, (2) an organonickel compound (Ni), and (3) a fluorinated mixture wherein the improvement comprises utilizing a mixture of hydrogen fluoride etherate (HF.Eth) and boron trifluoride etherate (BF_3.Eth) and boron trifluoride etherate (BF_3.Eth) where the molar ratio of fluoride to aluminum (F/Al) (total fluoride from BF_3.Eth and HF.Eth) ranges upward from 3.0/1 to 20/1 when the mole percent of HF with respect to the total fluoride ranges from about 5 percent to 50 percent and when the mole percent of HF with respect to the total fluoride ranges from 50.1 percent to 95 percent, then for every one percent increase of HF in said hydrogen fluoride etherate and boron trifluoride etherate mixture, the F/Al molar ratio starting at 20/1, is decreased by 0.377.

3,985,942

REGULATION OF THE DEGREE OF POLYMERIZATION OF VINYL OR VINYLIDENE MONOMERS WITH 2,5-DIHYDROFURANS

Masayasu Suzuki; Mitsuru Hoshino, and Masaki Ohya, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

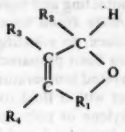
Filed Jan. 15, 1975, Ser. No. 541,272

Claims priority, application Japan, Jan. 23, 1974, 49-9920

Int. Cl.[2] C08F *234/02*

U.S. Cl. 526—270 7 Claims

1. In the free radical polymerization of at least one monomer selected from the group consisting of vinyl chloride, vinyl bromide, vinyl fluoride, styrene, vinyl acetate, methyl vinyl ether, ethyl vinyl ether, methyl vinyl ketone, ethyl vinyl ketone, phenyl vinyl ketone, acrylic acid, methacrylic acid, methyl acrylate, ethyl acrylate, n-propyl acrylate, isopropyl acrylate, n-butyl acrylate, octyl acrylate, 2-ethyl-hexyl acrylate, acrylonitrile, acrylamide, methyl methacrylate, ethyl methacrylate, and methacrylonitrile, the improvement which comprises conducting the polymerization in the presence of from 0.1 to 5.0 percent by weight, based on the total weight of monomer, of a compound having a chemical structure represented by



wherein:

R_1 is $+CR_5R_6\frac{}{n}R$, n=1;

R_2, R_5, and R_6 are members selected from the group consisting of a hydrogen atom and alkyl groups containing from 1 to 4 carbon atoms; and

R_3 and R_4 are hydrogen,

thereby to adjust the polymeric chain length.

3,985,943

ANAEROBICALLY HARDENING ADHESIVES AND SEALANTS CONTAINING ORGANIC DISULFONAMIDES

Werner Gruber, Dusseldorf-Gerresheim; Joachim Galinke, Dusseldorf-Holthausen, and Jürgen Keil, Monheim-Hitdorf, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Aug. 25, 1975, Ser. No. 607,467

Claims priority, application Germany, Sept. 2, 1974, 2441920

Int. Cl.[2] C08F *120/10*

U.S. Cl. 526—328 13 Claims

1. In an aerostable, anaerobically setting adhesive composition containing a polymerizable (meth) acrylate ester as principal latent adhesive component and a hydroperoxide polymerization catalyst therefor derived from hydrocarbons having a C_5–C_{18} chain length: a small but effective uniformly distributed amount in the range of 0.1 to 21% based on the weight of said composition of an organic disulfonamide as accelerator for said catalyst.

ELECTRICAL

3,985,944
APPARATUS AND METHOD FOR INCREASING ELECTRIC POWER OVER A RANGE OF POWER IN AN ELECTRIC GLASS MELTING FURNACE

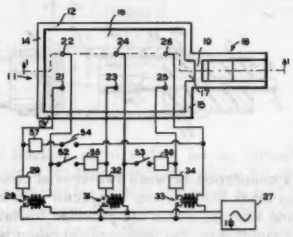
John F. Maddux, Heath, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 21, 1975, Ser. No. 560,920

The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.

Int. Cl.² C03B 5/02

U.S. Cl. 13—6 11 Claims



1. Apparatus for heating molten glass by Joule effect comprising a receptacle for the molten glass; an array of electrodes in said receptacle adapted to electrically conductively engage the molten glass; at least two groups of mated electrodes in said array; an individual source of alternating current electrical power electrically coupled to each of said mated groups; a conductive path selectively coupled between one of said electrodes of two of said groups; and means in said conductive path to selectively alter the electrical conduction of said path over a range of conduction.

3,985,945
DIRECT-CURRENT ARC FURNACE

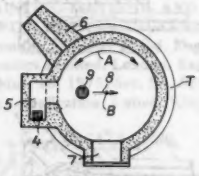
Sven-Einar Stenkvist, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Apr. 30, 1975, Ser. No. 573,357

Claims priority, application Sweden, May 21, 1974, 7406715

Int. Cl.² H05B 7/20

U.S. Cl. 13—11 1 Claim



1. A DC arc furnace comprising a furnace vessel having a lower portion for containing a melt, a cathodic arcing electrode positioned to form an arc on the melt in said portion, and an anodic contact electrode positioned for contact with said melt at a position laterally offset from said arcing electrode and arc, said furnace vessel being rotative about its vertical axis and said arcing electrode being fixed stationary in a lateral direction, whereby rotation of said vessel causes angular deflections of said arc in different lateral directions.

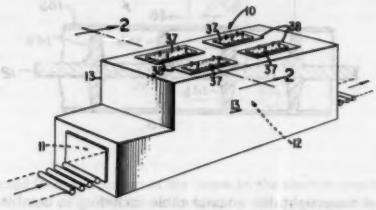
3,985,946
REMOVABLE HEATING ELEMENT FOR HIGH TEMPERATURE FURNACES

Ewald R. Werych, Elm Grove, Wis., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed Feb. 18, 1975, Ser. No. 550,291

Int. Cl.² F27D 11/02

U.S. Cl. 13—20 10 Claims



1. In an electrically heated refractory furnace, the combination of a refractory structure comprising a plurality of refractory brick means defining a heat treating chamber having a roof, one of the brick means of said roof being unitarily removable and having a plurality of vertical apertures therethrough, a plurality of rod elements supported within said apertures and having holding means on the lower ends thereof extending through said one of said brick means into said heating chamber, and an electrical heating element means suspended on said holding means and having leads extending upwardly through said brick means.

3,985,947
DEVICE AND METHOD FOR CRUCIBLE-FREE ZONE MELTING OF CRYSTALLIZABLE RODS IN PARTICULAR SEMICONDUCTOR RODS

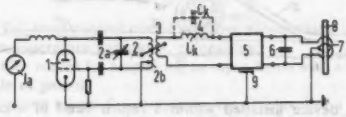
Wolfgang Keller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 30, 1975, Ser. No. 572,966

Claims priority, application Germany, May 27, 1974, 2425468

Int. Cl.² H05B 5/00

U.S. Cl. 13—26 9 Claims



8. In a method for crucible-free zone melting of a crystallizable rod, in particular a semiconductor rod, wherein an induction heating coil of an oscillatory heating circuit is inductively coupled to a rod and fed by a high frequency generator via coupling elements, the improvement comprising the steps of:

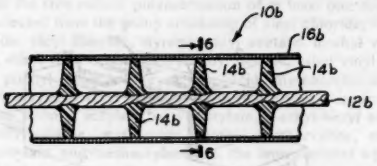
adjusting the power transmission to the heating circuit, at a given output frequency of the high frequency generator, to provide sufficient power transmission to sustain melting at a maximum diameter of the rod;

maintaining the adjusted power transmission constant in respect of different diameters of the rod; and cooling at least one of the coupling elements to dissipate heat increases therein due to heating the rod at diameters less than the maximum diameter.

3,985,948
WATERTIGHT DISC COAXIAL CABLES

Jerzy A. Olszewski, Edison, and Ludwik Jachimowicz, Elizabeth, both of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Continuation-in-part of Ser. No. 419,495, Nov. 28, 1973, abandoned. This application Mar. 12, 1975, Ser. No. 557,646
Int. Cl.² H01B 11/18, 13/22
U.S. Cl. 174—28 14 Claims

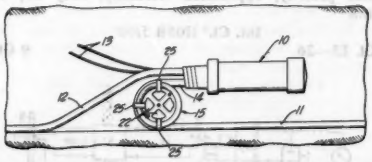


1. A watertight disc coaxial cable including in combination a center conductor having a copper circumferential surface, a plurality of axially-spaced dielectric discs firmly secured to the center conductor at spaced locations along the length of said conductor, and means for providing tenacious adherence of the discs to the copper, said means comprising a non-metallic conversion coating which is a copper-chromium salt between the copper surface of the center conductor and the surface of the disc that confronts the center conductor, and a tubular outer conductor surrounding the discs and exerting radial pressure on the discs, said discs being imperforate and adhered to the inner and outer conductors so as to divide the interior of the coaxial cable into watertight compartments.

3,985,949
CABLE WITH TURN BACK PROTECTOR

George W. Gillemot, Santa Monica, Calif., assignor to John T. Thompson, Los Angeles, Calif., a part interest

Continuation of Ser. No. 411,648, Nov. 1, 1973, abandoned. This application May 30, 1975, Ser. No. 582,252
Int. Cl.² H02G 1/00
U.S. Cl. 174—70 R 2 Claims



1. A device installed within a return bend of a cable to rigidly support the return bend and prevent bending of the cable through an arc having less than a predetermined minimum radius, said device comprising:

a. a circular disc of rigid material provided with an external circumferential groove having a width not less than the diameter of said cable and an inner radius not less than the inner radius of said return bend in said cable;

b. said circular disc being installed in said return bend in said cable with said return bend in said cable disposed in said external circumferential groove in said circular disc;

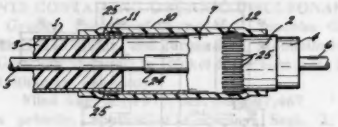
c. said circular disc being provided with circumferentially spaced openings inwardly of the periphery thereof; and

d. at least two tie means inserted through said openings in said circular disc at points spaced apart circumferentially of said circular disc and wrapped around the periphery of said circular disc and said return bend in said cable, whereby to immovably secure said circular disc in said return bend of said cable.

3,985,950
CONNECTION BETWEEN COAXIAL CONDUCTOR PAIRS

Georg Maltz, Burgdorf, Germany, assignor to Kabel-und Metallwerke Guteboffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Jan. 30, 1975, Ser. No. 545,417
Claims priority, application Germany, Feb. 9, 1974, 2406236
Int. Cl.² H02G 15/08; H01R 5/04
U.S. Cl. 174—88 C 2 Claims



1. In a connection between two coaxial conductors, each having an inner and an outer conductor with spacers in between, and wherein means are provided for interconnecting the inner conductors, the improvement comprising

a sleeve having axially extending fingers with slots in between and at both ends of the sleeve, the end portions with fingers being respectively slipped over the outer conductors for gripping engagement thereof by the fingers;

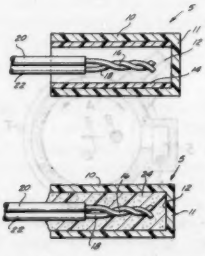
two annular solder bonds at both sleeve ends bonded to the fingers and to the respective outer conductor portions as exposed through the slots between the fingers; and

a shrunk hose on the sleeve and overlapping the two outer conductors to hold the sleeve additionally on the conductors.

3,985,951
ELECTRICAL INSULATOR INCLUDING A POLYMERIC RESIN FOAM FORMING COMPOSITION AND METHOD OF INSULATION

Robert L. Harris, Freeport, N.Y., assignor to Niemand Bros. Inc., Elmhurst, N.Y.

Filed July 10, 1975, Ser. No. 594,796
Int. Cl.² H01B 17/58, 3/18; H01R 5/12
U.S. Cl. 174—138 F 11 Claims



1. A sheath for protecting electrical conductors and connections, which comprises; a tubular body having first and second ends, said body with said ends defining an empty space to receive and enclose electrical conductors and connections, and an unfoamed, expandable, synthetic, polymeric resin foam forming composition coating the inside walls of said tubular body.

3,985,952

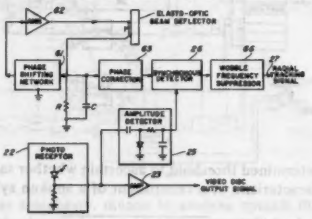
ELASTO-OPTIC DEVICE FOR SPOT WOBBLE IN A VIDEO DISC PLAYER

Robert Adler, Northfield, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 439,683, Feb. 4, 1974, abandoned. This application Jan. 27, 1975, Ser. No. 544,250

Int. Cl.² H04N *5/76;* **G11B** *11/00*

U.S. Cl. 178—6.6 R **3 Claims**



1. A radial tracking servo system for an optical-pickup video disc player of the type comprising means for producing a light beam and means for causing said beam to read a record track on a rotating record disc, which servo system comprises:

an elasto-optic light beam deflector including a transparent prism interposed in the path of said beam and an electromechanical transducer mechanically coupled to said prism and adapted to establish vibration therein in a mechanically resonant vibration mode;

a reference signal oscillator including said elasto-optic light beam deflector as its frequency-determining element, for causing periodic lateral deflection of said light beam relative to said record track;

means including a photoreceptor responsive to said light beam for developing an output signal including an amplitude modulation component representative of deviations of said periodically laterally deflected light beam from a centered relationship to said record track;

a quadrature phase corrector coupled to said reference signal oscillator for developing a phase-shifted reference signal;

means coupled to said photoreceptor for deriving said amplitude modulation component;

and a synchronous detector coupled to said phase corrector and to said last-mentioned means and responsive to said phase-shifted reference signal and to said amplitude modulation component for developing a radial tracking error correction signal.

3,985,953

GRAVURE PRINTING METHODS AND APPARATUS WITH ROTARY SHUTTER

Rowland A. G. Dunkley, Chorley Wood, England, assignor to Crosfield Electronics Limited, London, England

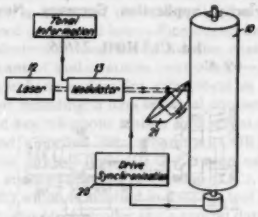
Filed Mar. 18, 1975, Ser. No. 559,407

Claims priority, application United Kingdom, Mar. 20, 1974, 12366/74

Int. Cl.² G11B *11/00*

U.S. Cl. 178—6.6 B **11 Claims**

1. A method of preparing a printing member in which an energy beam is directed at the surface of the printing member, and in which the surface and energy beam undergo relative movement such that an image-forming area of the surface is scanned, element by element, by the beam, the beam having a power sufficient to decompose or evaporate material from the surface, the method comprising periodically intercepting the path of the beam to the printing surface during the scanning by a rotary shutter positioned either substantially in the plane of the surface or in a plane conjugate with the surface plane with respect to a lens focusing the beam, the shutter having a speed of rotation such that the shutter in the surface plane or the shutter image in the surface plane, respectively, is substantially stationary relative to the surface during passage across the beam, the portions of the surface which are



protected from the action of the beam by the shutter providing walls for the cells which are formed by the decomposition or evaporation of material from the surface and which will retain ink during printing.

3,985,954

DC LEVEL CONTROL CIRCUIT

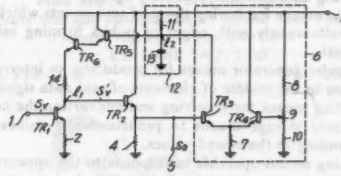
Yasunobu Kuniyoshi, Tokyo, and Takao Tsuchiya, Fujisawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 17, 1975, Ser. No. 568,783

Claims priority, application Japan, Apr. 19, 1974, 49-43994

Int. Cl.² H04N *5/18;* **H03K** *5/08*

U.S. Cl. 178—7.3 DC **5 Claims**



3. A DC level control circuit which is substantially insensitive to temperature variations, comprising:

amplifier means for amplifying an input signal with a magnitude of gain n;

comparison means for comparing the DC level of a predetermined portion of the amplified signal to a reference level;

emitter-follower means for supplying said amplified signal to said comparison means;

means coupled to said comparison means for providing a DC bias potential, said DC bias potential being varied in accordance with said comparison between said amplified signal DC level and said reference level;

feedback means comprised of m cascaded semiconductor PN junctions for coupling said DC bias potential to the emitter-follower means input so as to correspondingly vary the DC level of said amplified signal; wherein m and n are numbers and the sum of m and the number of stages included in said emitter-follower means is equal to *n;* and

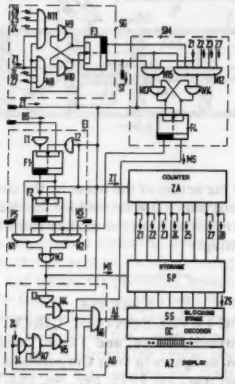
output means coupled to said emitter-follower means for receiving said amplified signal.

3,985,955

APPARATUS FOR MEASURING THE DISTORTION OF DATA SIGNALS

Gerhard Blass, Munich, and Johann Disl, Bad Tolz, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 22, 1974, Ser. No. 526,214
Claims priority, application Germany, Nov. 22, 1973, 2358296
Int. Cl.² H04L 25/06
U.S. Cl. 178—69 A 8 Claims



1. Apparatus for measuring the distortion of data signals, comprising:

counter means for counting a pulse train of constant repetion frequency, said counter means counting from a predetermined initial value to a predetermined final value during an element of said data signal,

storage means for storing those of said counts which occur simultaneously with edges of pulses forming said data signal,

first pulse generator means for producing an interrogation pulse in the middle of elements of said data signal,

decoding means for receiving and converting the contents of said storage means to predetermined values corresponding to the stored values,

blocking means operable in response to the appearance of a said interrogation pulse for coupling the contents of said storage means to said decoding means and

display means for visually displaying the output of said decoding means.

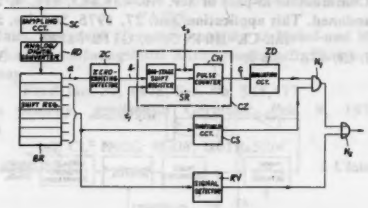
3,985,956

METHOD OF AND MEANS FOR DETECTING VOICE FREQUENCIES IN TELEPHONE SYSTEM

Giancarlo Monti, Milan, and Isidoro Poretti, Castiglione Olona, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Apr. 23, 1975, Ser. No. 570,581
Claims priority, application Italy, Apr. 24, 1974, 21869/74
Int. Cl.² G10L 1/02
U.S. Cl. 179—1.5 A 6 Claims

1. A method of monitoring the activity of a periodically sampled voice-communication line with conversion of each analog line-voltage sample into a binary word including a polarity bit, comprising the steps of comparing successive polarity bits from the sampled line with one another, counting the number of changeovers in the binary value of said successive polarity bits within a predetermined test interval substantially longer than a sampling period, deriving from the rate of change of said number of changeovers, counted in successive test intervals, a numerical value indicative of the character of a signal on said line, and comparing said numerical value with



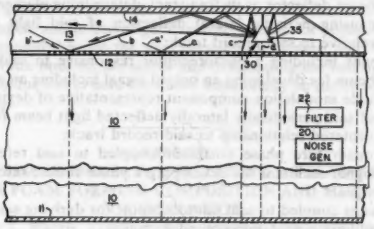
a predetermined threshold to ascertain whether said signal has the characteristic of a constituent of a spoken syllable.

3,985,957

SOUND MASKING SYSTEM FOR OPEN PLAN OFFICE

William R. Torn, St. Charles, Ill., assignor to DuKane Corporation, St. Charles, Ill.

Filed Oct. 28, 1975, Ser. No. 626,240
Int. Cl.² H04K 1/00
U.S. Cl. 179—1.5 M 3 Claims



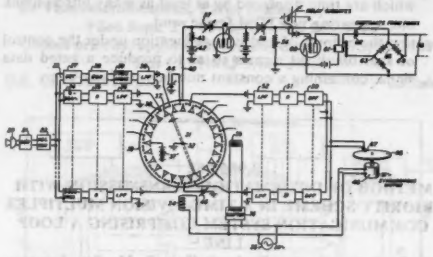
1. An acoustic masking system for obtaining conversational privacy in an open plan office space having a floor and an acoustic ceiling wiith a plenum space above said ceiling, said plenum space having its own sound reflecting ceiling, said office acoustic ceiling having characteristics incuding sound absorption, reflection and transmission therethrough, said system having a generator for providing electric currents which are reproduced by a loud speaker as predetermined random noise, and speaker means connected to be energized by said generator output, said speaker means consisting of at least one cluster of two speakers for mounting in said plenum region, a cluster having a trigonal prism-shaped speaker cabinet having three flat prism panels shaped and assembled to form a triangular prism-shaped hollow cabinet with two triangular end plates, a loud speaker mounted in two of said prism side panels, each panel functioning as a baffle board for propagating sound outwardly by its speaker, said cabinet being adapted to be installed in the plenum region to orient said prism horizontally, said speakers being symmetrically disposed in their panels when said cluster is installed and being equally inclined from a horizontal plane in such installed position, said speakers being similar and adapted to be similarly energized so that sound waves from said speakers can travel along air paths to solid surfaces for reflection therefrom, absorption thereby, and transmission therethrough to provide masking background noise in the open plan office.

3,985,958

SECRET TELEPHONY

Homer W. Dudley, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 18, 1941, Ser. No. 423,437
Int. Cl.[2] H04K *1/04*
U.S. Cl. 179—1.5 R 17 Claims



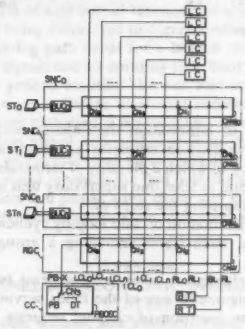
1. In secret telephony, means to analyze speech message waves into slowly varying currents representative of energy variations in respective portions of the speech frequency band, distributor means for rapidly switching fragments of said currents to line in rotation, a source of masking currents for each of said slowly varying currents, the masking currents each varying in magnitude in random manner, and sychronously operating means for adding masking current from a respective source to each fragment of the switched currents.

3,985,959

KEY TELEPHONE SYSTEM FOR SUBSCRIBERS

Shigeharu Komine; Yoshiaki Tanaka, and Shiro Kuzuya, all of Tokyo, Japan, assignors to Oki Electric Industry Company, Ltd.

Filed Sept. 30, 1975, Ser. No. 618,122
Claims priority, application Japan, Oct. 5, 1974, 49-114305
Int. Cl.[2] H04M *11/06, 1/00*
U.S. Cl. 179—2 DP 2 Claims



1. A key telephone system for subscribers comprising: a key telephone station (ST) having indication lamps (for example, LP, PLP, OPBL) which indicate the status of the key telephone station, and a plurality of function buttons (for example, OPB, PB, HLD, INTR, INTO); a subscriber common equipment (CE) which is comprised of a plurality of connecting network circuits (for example, CNW_0, CNW_1 . . . CNW_n), line circuits (LC), intra-office circuits (IC) and a common controller (CC) which controls said connecting network circuits, line circuits and intra-office circuits, where said connecting network circuits connect a speech line (SL) of one key telephone station and a speech line (SL) of the other key telephone station by using a register connecting circuit (RGC) and switching network circuits (for example, SNC_0, SNC_1 . . . SNC_n), each of which switching network circuits cooperate with both line circuit links (for example, LCL_0, LCL_1 . . . LCL_n) and intra-office circuit links (for example, ICL_0, ICL_1 . . . ICL_n), and; control lines (CL) which connect each of said key telephone stations and said subscriber common equipment, wherein a desired one of said line circuit links is caught by dialing a desired line circuit number by using push buttons means (PB) of said common controller, which desired line circuit number is indicated on said indication lamp (LP), while the desired one of said intra-office circuit links is caught by pushing a desired intra-office button (for example, INTR, INTO), by means of said common controller.

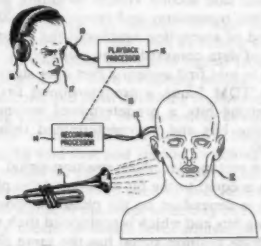
2. A key telephone system for subscribers as set forth in claim 1, further including: a data terminal equipment (TAM) located on said key telephone station side; a first data separator (CAN) and a second data separator (COR) which are inserted in data control lines (CL′) between said key telephone station and said common controller (CC); a third data separator (CIR) which is inserted in data control lines (CL″) between said common controller and a central data processing unit (CPU); wherein data relating to said key telephone station are transmitted through said control lines (CL) during a first time-slot by way of said first, second and third data isolators, and data relating to said data terminal equipment are transmitted through both said control lines (CL) and said data control lines (CL′, CL″) during a second time-slot by means of said first, second and third data isolators, whereby data transmission is effected between one of said data terminal equipments and the other of said data terminal equipments and between one of said data terminal equipments and said central data processing unit during said second time-slot.

3,985,960

STEREOPHONIC SOUND REPRODUCTION WITH ACOUSTICALLY MATCHED RECEIVER UNITS EFFECTING FLAT FREQUENCY RESPONSE AT A LISTENER'S EARDRUMS

Robert Lee Wallace, Jr., Warren Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 3, 1975, Ser. No. 554,594
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.[3] H04R *1/02, 5/00*
U.S. Cl. 179—1 G 14 Claims



1. An in-ear receiver for effecting a substantially flat frequency response at a user's eardrum comprising:

an electroacoustic motor element for supplying an acoustic signal in response to a supplied electrical signal;

a hollow housing adapted for retaining said motor element at one end thereof;

acoustic impedance matching means for transforming the impedance of said electroacoustic motor element so that said transformed impedance is below the impedance of the user's ear canal, said impedance matching means mounted within said hollow housing adjacent to said motor element;

an acoustic resistance mounted within said hollow housing adjacent to said impedance matching means, said acoustic resistance substantially identical to said characteristic impedance of said user's ear canal; and

end plate means mounted across the end of said hollow housing adjacent to said acoustic resistance, said end plate means adapted for insertion in the outer opening of said user's ear canal, said end plate including an orifice for acoustically coupling the signals produced by said electroacoustic motor element to said ear canal.

13. In a stereophonic recording system including a recording mannequin equipped with recording microphones and means for processing the signal produced by said microphones for playback to a remote listener, the improvement comprising acoustic impedance means mounted within said recording mannequin for establishing the acoustic signal which impinges upon said microphones substantially identical to that acoustic signal which would reach the eardrums of a human listener occupying the same location as said recording mannequin.

3,985,961

METHOD FOR THE TIME DIVISION MULTIPLEX TRANSMISSION OF DATA

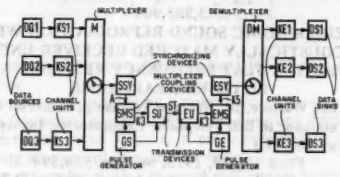
Hans Heinrich Voss, Munich; Karl Georg Dieter, Konigsdorf, and Konrad Reisinger, Zorneding, all of Germany, assignors to Siemens Aktiengeselischaft, Munich, Germany

Filed Mar. 17, 1975, Ser. No. 559,078

Claims priority, application Germany, Mar. 18, 1974, 2412962

Int. Cl.² H04J 3/06

U.S. Cl. 179—15 AF **10 Claims**



1. In apparatus for time division multiplex (TDM) transmission of data between a first system and a second system asynchronous therewith, said first system including a transmitter multiplexer and said second system including data transmission units in the transmitter and receiver of said second system, a method of correcting synchronizing errors during the transmission of data comprising the steps of:

generating in said first system a first data signal comprising within a TDM frame a predetermined first number of synchronizing bits, a predetermined second number of information bits and a predetermined third number of blank bits,

producing a rectangular phase position signal, the duration of which is equal to the bit period and the phase position of which is dependent on the phase position of said synchronizing bits and which is positioned such that one edge of the phase position signal has the same phase position as said synchronizing bits,

coupling said first data signal to a first bistable circuit which is controlled by said phase position signal, said first bistable circuit producing a second data signal,

applying said second data signal to a second bistable circuit which is controlled in accordance with the clock frequency of said second system, said second bistable circuit producing a third data signal which in addition to said predetermined first number of synchronizing bits and said second number of information bits contains a variable number of blank bits,

forming a TDM frame of predetermined duration responsive to said synchronizing bits and producing a TDM frame signal indicating the TDM frame,

counting the clock frequency of said second signal throughout the duration of said TDM frame and producing blank bit signals indicating the number of blank bits appearing throughout the duration of said TDM frame in addition to said synchronizing bits and said information bits,

storing said third data signal in storage locations from the outputs of which bit-displaced data signals may be taken which are time displaced by at least as many bits as blank bits appearing per TDM frame, and

gating the outputs of said storage location under the control of said blank bit signals so as to produce a gated data signal containing a constant number of blank bits.

3,985,962

METHOD OF INFORMATION TRANSMISSION WITH PRIORITY SCHEME IN A TIME-DIVISION MULTIPLEX COMMUNICATION SYSTEM COMPRISING A LOOP LINE

Ivor Jones, Winchester, England; Hans R. Mueller, Langnau, Switzerland; Daniel Wild, Kilchberg, Switzerland, and Pitro A. Zafiropulo, Horgen, Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

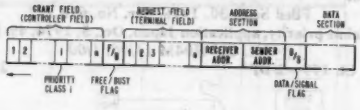
Continuation-in-part of Ser. No. 279,595, Aug. 10, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,500

Claims priority, application Switzerland, Aug. 13, 1971, 11976/71

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² H04J 3/08

U.S. Cl. 179—15 AL **6 Claims**



1. A method of information transmission with a priority scheme in a time-division multiplex communication system comprising a loop to which a plurality of terminals of different priority classes and at least one supervisory unit are attached, said method comprising the steps of:

transferring information on said loop by cyclically consecutive frames, each frame including a group of control characters;

said control characters comprising at least two fields for priority assignment, one of the fields serving as request field for the insertion of channel requests by attached terminals, discernable by priority class, and one other field serving as a grant field for characterizing which priority class may occupy the transmission channel represented by the corresponding frame;

formulating the contents of the grant field at said supervisory unit from the contents of a request field previously transmitted over the loop; and

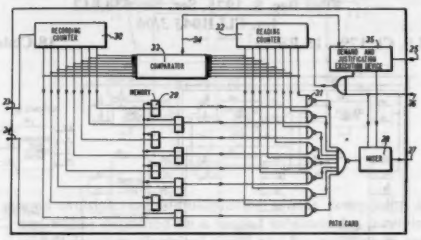
determining at each terminal, if that terminal has requested channel allocation during the preceding cycle and if the grant field of the frame in the current cycle does not contain an identification of a class with higher priority than that of the respective terminal, or if the grant field of the frame in the current cycle does not contain any priority class identification and if so, seizing the frame of the current cycle for information transmission.

3,985,963

DEVICE FOR ENSURING IN AN INTERMEDIATE STATION THE TRANSFER AND THE BRANCH CONNECTION OF AT LEAST ONE MULTIPLEXED NUMERICAL DATA CHANNEL

Patrick Emile Boutmy, Lannion, and Jean Gaston Walraet, Perros-Guirec, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Sept. 27, 1974, Ser. No. 509,967
Claims priority, application France, Oct. 3, 1973, 73.35278
Int. Cl.² H04J 3/08, 3/06
U.S. Cl. 179—15 BD 2 Claims



1. In a transmission system having an intermediate station which includes a general emitting element provided with a first clock and a plurality of input terminals and a general receiving element provided with a second clock and a plurality of output terminals, a device for ensuring the transfer and branch connection of at least one channel of plesiochronous numerical data multiplexed in accordance with a specific field of the transmission system, which comprises: means for synchronizing in frequency and phase said first clock with said second clock, a plurality of receiving path cards having input terminals and means connected thereto for effecting a branch connection of the component signal, certain of said output terminals of said general receiving element being connected directly to corresponding input terminals of said general emitting element for transfer of said component signal therebetween; certain of said output terminals of said general receiving element being connected to corresponding input terminals of said receiving path cards for a branch connection of said component signal; and an emitting path card connected to an input of the general emitting element, said emitting path card comprising a mixer having an output constituting the output of said emitting path card, a first input for receiving a justification indication signal and a second input for receiving the information and justification signal, said mixer being arranged to deliver a signal in which the first half of each bit comprises an information and justification signal and the second half of each bit comprises a justification indication signal.

3,985,964

4-CHANNEL STEREOPHONIC DEMODULATING SYSTEM

Tsuneo Ohkubo, Katano, and Yoshio Horiike, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

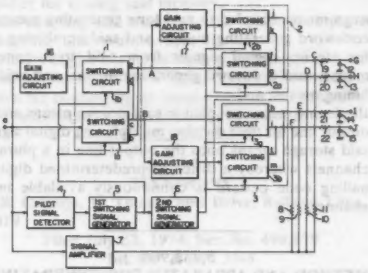
Continuation of Ser. No. 314,673, Dec. 13, 1972, abandoned.
This application Oct. 24, 1974, Ser. No. 517,610
Claims priority, application Japan, Dec. 16, 1971, 46-103088; Dec. 16, 1971, 46-103089; Dec. 16, 1971, 46-103090; May 29, 1972, 47-53723; May 29, 1972, 47-53724; May 29, 1972, 47-53725
Int. Cl.² H04H 5/00; H04R 5/00
U.S. Cl. 179—15 BT 17 Claims

11. A 4-channel stereophonic demodulating system for demodulating a 4-channel stereophonic composite signal containing a main channel signal component constituted by a first one of four different combinations of signals, said combinations of signals being obtained from four signals stereophonically related to one another, a first subchannel signal component obtained through suppressed-carrier amplitude modulation of a second one of said combinations of signals on a first subcarrier wave, a second subchannel signal component obtained through suppressed-carrier amplitude modulation of a third one of said combinations of signals on a second subcarrier wave 90 degrees out of phase with respect to said first subcarrier wave, a third subchannel signal component obtained through suppressed-carrier amplitude modulation of a fourth one of said combinations of signals on a third subcarrier wave at double the frequency of said first and second subcarrier waves, at least one of said subchannel signal components having a level different from the levels of the other subchannel signal components, and a pilot signal having a frequency one half of said first subcarrier wave,

said demodulating system comprising:

means for producing a first switching signal at a harmonic frequency of said pilot signal;

means for producing a second switching signal at a harmonic frequency of said pilot signal;



first switching means supplied with said 4-channel stereophonic composite signal and operated by said first switching signal for producing a pair of output signals from the supplied composite signal;

second and third switching means operated by said second switching signal for producing four audio signals at their output terminals from the output signals of said first switching means;

means for supplying the outputs of said first switching means to said second and third switching means;

means for deriving said four audio signals from the outputs of said second and third switching means;

said first, second and third switching means each having two switching circuits, said two switching circuits being supplied with input signals of said switching means, and operated by said first and second switching signals; and

supplying means for supplying an output signal of one of the two switching circuits of each of said switching means to an output signal of the other switching circuit of said each switching means to obtain level adjustment between the first, second and third subchannel signal components.

3,985,965

DIGITAL SIGNAL GENERATOR

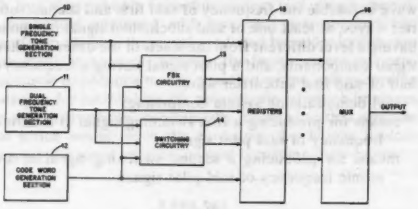
Robert G. Field, Millis, and Marvin S. Mason, Lexington, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 2, 1975, Ser. No. 592,650
Int. Cl.² H04J 3/12
U.S. Cl. 179—15 BY 5 Claims

1. Digital signalling code generating apparatus including tone generating means for producing a plurality of recurring sequences of digital signals, each capable of being converted to a continuous audible tone;

codeword generating means for producing a plurality of recurring sequences of digital signals, each providing a continuously repeated codeword;

combining means coupled to said tone generating means and said codeword generating means for producing a plurality of recurring sequences of digital signals which are combinations of sequences of digital signals produced by said tone generating means, and said codeword generating means; and



storage means coupled to said tone generating means, said codeword generating means, and said combining means for storing digital signals from said tone generating means, said codeword generating means, and said combining means; and

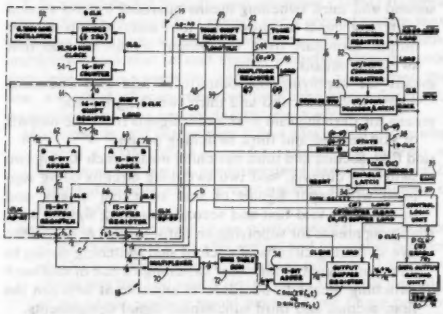
mulitplexing means coupled to said storage means and to an output line for time division mulitplexing digital signals in said storage means onto the output line in a plurality of channels whereby a different predetermined digital signalling code pattern is continuously available in each channel.

3,985,966

METHOD AND APPARATUS FOR GENERATING DIGITAL DUAL FREQUENCY SIGNALS

John D. Edwards, Campbell, Calif., assignor to Rolm Corporation, Cupertino, Calif.

Filed July 23, 1975, Ser. No. 598,291
Int. Cl.² H04J *3/00;* **H03B** *19/00*
U.S. Cl. 179—15 BY **12 Claims**



8. For use in an electronic communication system, apparatus for generating a multi-bit digital representation of an analog signal having two frequency components, said apparatus comprising:

means for generating a first multi-bit digital signal representative of said analog signal;

means for generating a second multi-bit digital signal representative of a fractional portion of a standard time interval;

means for multiplying said first digital signal by said second digital signal to form a pair of multi-bit digital product signals each representative of the phase of a different one of said two frequency components relative to said standard time interval;

means for converting each of said digital product signals to a multi-bit digital amplitude signal; and

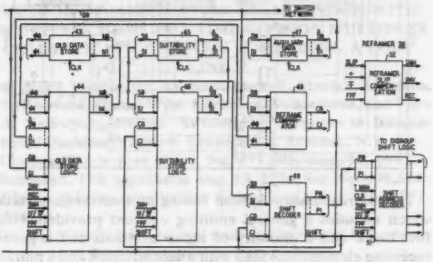
means for summing the multi-bit digital amplitude signals to produce a single multi-bit amplitude signal.

3,985,967

COMMON CONTROL CONSTANT SHIFT REFRAME CIRCUIT

John Robert Colton, Freehold; Robert Bruce Heick, Eatontown, and Henry Mann, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 8, 1975, Ser. No. 638,812
Int. Cl.² H04J *3/06*
U.S. Cl. 179—15 BS **18 Claims**



1. In a time division multiplex system wherein a plurality of digital groups of time division multiplexed channels are time multiplexed together onto a common transmission link, each digital group including a similar predetermined framing bit pattern; a reframer circuit comprising means for storing a given number (m) of selected data bits of each digital group and for cyclically reading the m data bits of each digital group out of store in time coincidence with the appearance of each digital group on said common bus, comparator means serving to compare the output of said means with m data bits of the same digital group that occur one or more frames later in time, suitability storage means for recording for each digital group which of the compared m data bits have had framing pattern violations and which appears as a suitable candidate for the framing bit, shift decoder means coupled to the output of said comparator means and said suitability storage means and serving to search for the framing bit within a window defined by the m bits until it has determined that all m bits are unsuitable or that the true framing bit is within the window, means for loading m new bits into the first recited means and for initializing the suitability storage means for the new m bits when all m bits within said window are unsuitable, and means for shifting the multiplexed data bits of an out-of-frame digital group from one to m bit positions in response to determinative signals from said shift decoder means.

3,985,968

MULTIPLEX DATA COMMUNICATIONS USING ACOUSTICAL SURFACE WAVE FILTERS

William K. Stelzenmuller, Poughkeepsie, and Ernest L. Walker, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,673
Int. Cl.² H03H *7/10;* **H04J** *1/00*
U.S. Cl. 179—15 BC **10 Claims**

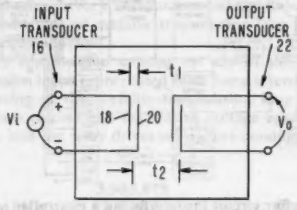
1. A data transmission system for transmitting information contained in one or more message signals over a common transmission medium between a transmitting station and a receiving station comprising:

first multiplexing/demultiplexing means comprising a plurality of acoustic surface wave (ASW) filters deposited on a first substrate for receiving message signals from respec-

tive message signal sources to thereby set up acoustic surface waves in said substrate;

coding means for coding said plurality of acoustic surface wave filters so that the acoustic surface waves induced in said substrate are likewise coded;

an output filter deposited on said first substrate for receiving said coded acoustic surface waves to thereby convert said waves to an electrical signal which is a summation of the individual waves for transmission over a common transmission medium to said receiving station;



second multiplexing/demultiplexing means comprising an input filter deposited on a second substrate for receiving said summation electrical signal and for inducing in said second substrate a composite acoustical surface wave which is the acoustical equivalent of said summation electrical signal;

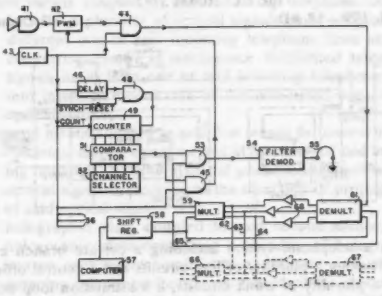
and a further plurality of coded acoustical surface wave filters deposited on said second substrate which are a mirror image of said plurality of coded filters deposited on said first substrate to thereby decode said composite acoustical waves into electrical message signals having information identical to the information contained in said message signals received by said first substrate.

3,985,969

SIMULATED COMMUNICATIONS SYSTEM

Robert M. Eisenberg, Woodbine, Md., assignor to The Singer Company, Binghamton, N.Y.

Filed Aug. 14, 1975, Ser. No. 604,568
Int. Cl.² H04J 3/00
U.S. Cl. 179—15 A **7 Claims**



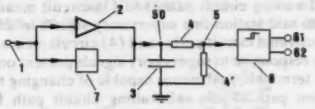
1. A system providing for communications among a plurality of independent communications stations, said system comprising a plurality of communications stations, a plurality of pulse width modulated communications channels, means in each station for selecting one of said pulse width modulated communications channels for transmission and reception, and computer controlled digital means for directing communications among said individual stations to provide for communication nets each comprising selected stations and to prevent communications between selected stations.

3,985,970

REGENERATION OF SIGNALLING PULSES

Raymond Lerault, and Jean-Claude Bulte, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Apr. 11, 1975, Ser. No. 567,437
Int. Cl.² H04Q 1/36
U.S. Cl. 179—16 EA **6 Claims**



4. Apparatus for restoring signal pulses in an analog communication system comprising:

a D.C. linear current amplifier;

a memory;

a return to zero circuit connected in parallel with said amplifier for erasing said memory;

means coupling said memory to the common output of said amplifier and return to zero circuit;

a Schmitt trigger having its input connected to said memory and generating restored signal pulses at its output; and

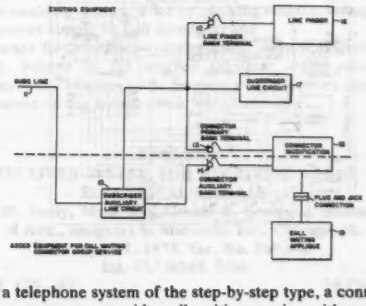
means for connecting an input signal to the common input of said amplifier and return to zero circuit.

3,985,971

TELEPHONY

John R. Colpoys, 10 Thunderbird Drive, Ballston Lake, N.Y. 12019

Filed July 22, 1974, Ser. No. 490,879
Int. Cl.² H04M 3/48
U.S. Cl. 179—18 BG **1 Claim**



1. In a telephone system of the step-by-step type, a connector group means to provide call-waiting service with equipment units shared in common by all lines in said connector group comprising:

a. A station line circuit arrangement including (1) a primary connector bank appearance, and an auxiliary bank appearance on upper and lower bank terminals, at equal switch bank coordinate position, and (2) an auxiliary relay providing direct circuit continuity from the station line to either said primary bank terminals or said auxiliary bank terminals.

b. Connector switches modified to connect to said station line circuit with six brushes simultaneously, three at each of said equal upper and lower bank coordinate positions.

c. Said connector switches further modified to incorporate (1) circuit means and configuration providing call-terminating service, as well as a means and configuration providing call-waiting service through said auxiliary bank appearance, and (2) circuit means responsive to primary and auxiliary bank supervisory signals originated by other

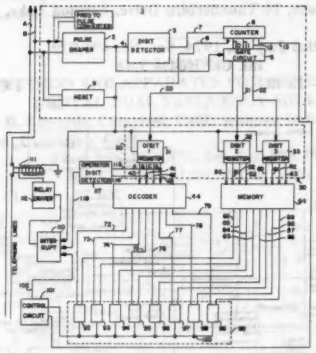
switch units, and (3) circuit means supplying supervisory signals to primary and auxiliary bank terminals to which said station line circuit and other switch units may respond.

d. Said modified connector switches when activated in said call-waiting configuration providing (1) a circuit path from said station line circuit auxiliary bank to said station line circuit primary bank, and (2) means to activate a circuit path from said station line circuit auxiliary bank to a call-waiting circuit path, and (3) circuit means reponsive to said station line supervisory signals in said (1) or (2) activated circuit paths, and (4) circuit means continuously responsive to supervisory signals present on primary bank terminals; said means capable of changing the transmission path of the call-waiting circuit path from the auxiliary bank to the primary bank if the primary bank otherwise becomes idle.

3,985,972
TELEPHONE CALL RESTRICTOR

Robert J. Rolin, 1410 Willowtree Court, San Jose, Calif. 95119, and Richard Arden Sales, 3055 Jenkins, San Jose, Calif. 95118

Filed Aug. 8, 1974, Ser. No. 495,654
Int. Cl.² H04M 1/66
U.S. Cl. 179—18 DA **22 Claims**



1. A telephone call restrictor comprising:

a digit register means for receiving a plurality of digits of a multi-digit telephone number from a telephone line;

means for coupling said digit register means to said telephone line;

decoding means coupled to said digit register means and responsive to a first predetermined number of said plurality of digits for providing a first plurality of outputs;

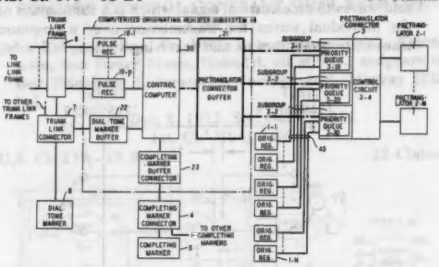
second means coupled to said digit register means and addressable by a second predetermined number of said plurality of digits for providing a second plurality of outputs; and

means responsive to said first and said second pluralities of outputs for providing an interrupt signal to prevent the completion of a call to said telephone number in the absence of a predetermined correspondence between said first and said second outputs.

3,985,973
PREFERENCE ACCESS CIRCUIT

Donald Ray Shea, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 16, 1975, Ser. No. 587,407
Int. Cl.² H04Q 3/47
U.S. Cl. 179—18 ET **14 Claims**



1. A buffer circuit for interfacing a controller to a plurality of access circuits to obtain service from a serving circuit preferentially over a plurality of bid circuits competing for access to the serving circuits, each access circuit being operable to couple at least one of the bid circuits to the serving circuit in response to a bid signal therefrom and being operable to couple said buffer circuit to the serving circuit in response to a bid signal therefrom, said buffer circuit comprising

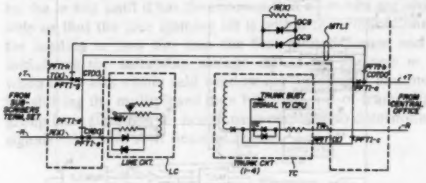
means operated in response to an initial controller service request for activating a bid signal to each one of said access circuits, and

means operated in response to a subsequent controller service request for holding activated at least one of said bid signals to maintain in the access circuit associated therewith a priority status based on the time of initial activation of said bid signals for serving the subsequent request.

3,985,974
POWER FAIL MONITOR AND TRANSFER CIRCUIT

Julius Jusinskas, Jr., Glenn Ellyn, and Lloyd L. Langsdorf, Streamwood, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 22, 1975, Ser. No. 642,955
Int. Cl.² H04M 3/42
U.S. Cl. 179—18 AD **9 Claims**



1. In a telephone system including a private branch exchange having a plurality of line circuits and a central office having a plurality of trunk circuits, a transmission loop normally being established between a subscriber on the private branch exchange via an associated one of the line circuits and one of the trunk circuits to the central office, a power fail monitor and transfer circuit for automatically establishing a metallic transmission loop from each of a plurality of said subscribers on the private branch exchange to a corresponding number of said trunk circuits to the central office comprising:

a. a relay associated with each of said metallic transmission loops, said relays normally being operated and upon being restored establishing said metallic transmission loops,

b. a relay driver transistor associated with each of said relays and normally biased conductive to operate said relays,

c. failure monitoring means operative to normally provide a biasing voltage to bias said relay driver transistors conductive to operate said relays and to remove said bias voltage in the event of a failure, and

d. detector means for detecting current flow associated with each of said metallic transmission loops, each of said detector means upon detecting current flow in its associated metallic transmission loop being operative to inhibit said relay driver transistor associated with said relay associated with said metallic transmission loop from being biased conductive,

e. whereby conversation existing on any of the metallic transmission loops is prevented from being interrupted by the opening of the metallic transmission loop when a failure is corrected and the biasing voltage again is provided to bias the relay driver transistors conductive.

3,985,975

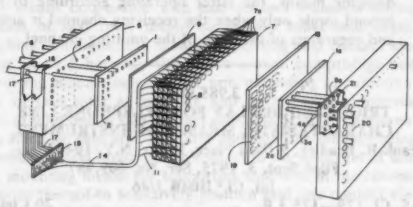
HOLOGRAPHIC TELEPHONE SWITCHING SYSTEM

Peter D. Steensma, Midland Park, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation-in-part of Ser. No. 555,227, March 4, 1975, abandoned. This application Oct. 20, 1975, Ser. No. 623,689

Int. Cl.² H04M *3/00;* **H04Q** *1/52;* **G02B** *5/32*

U.S. Cl. 179—18 GF **15 Claims**



1. A holographic switching system for connecting between incoming telephone lines and outgoing telephones lines comprising:

first means coupled to said incoming telephone lines to provide a plurality of optical signals each coupled to a different one of said incoming telephone lines and for converting electrical intelligence modulated telephone signals on at least one of said incoming telephone lines into intensity modulation of the associated one of said optical signals;

second means coupled to said first means for converting an electrical dialing signal on said at least one of said incoming telephone lines to a spatial phase modulation of said optical signals transverse to the direction of propagation of said optical signals;

a holographic plate coupled to said second means, said holographic plate containing a plurality of holographic images each corresponding to a different one of said outgoing telephone lines, said spatial phase modulated optical signals selecting and reconstructing one of said holographic images as determined by said dialing signal to enable transmission of intelligence carried by said optical signals through said reconstructed one of said holographic images; and

third means coupled to said holographic plate for receiving said intelligence of said optical signals and converting said received intelligence of said optical signals into a corresponding electrical signal for transmission on said selected one of said outgoing telephone lines as determined by said reconstructed one of said holographic images.

3,985,976

AUDIO FREQUENCY SIGNALLING SYSTEMS FOR TELEPHONE SYSTEMS

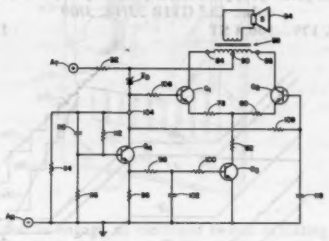
Michael Christopher John Cowpland, 11 Alderbrook Drive, Ottawa, Ontario K2H 5W4, and Terrance Headley Matthews, 99 Penfield Drive, Kanata, Ontario, both of Canada

Division of Ser. No. 377,831, July 9, 1973, Pat. No. 3,894,197. This application Feb. 10, 1975, Ser. No. 548,798

Claims priority, application Canada, June 26, 1973, 174906

Int. Cl.² H04M *1/60*

U.S. Cl. 179—81 B **25 Claims**



1. In combination with an amplifier for connection to a transmission line, the improvement comprising:

a. means responsive to a predetermined a.c. voltage and a d.c. voltage carried by the transmission line for applying said a.c. voltage to said amplifier in the event said a.c. voltage has an amplitude above a first predetermined amplitude threshold and for generating an enabling voltage in the event said a.c. voltage has an amplitude above a first predetermined amplitude threshold and said d.c. voltage has an amplitude above a second predetermined amplitude threshold;

b. means responsive to the presence of said enabling voltage for enabling said amplifier by applying said d.c. voltage as a power supply to said amplifier; and

c. means for inhibiting translation of said predetermined a.c. voltage by the enabled amplifier, while allowing translation of other audio frequency signals which may be present on the transmission line.

3,985,977

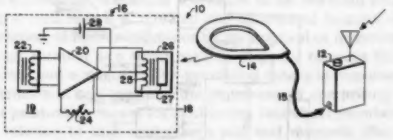
RECEIVER SYSTEM FOR RECEIVING AUDIO ELECTRICAL SIGNALS

David W. Beaty, Mesa, and Gerald R. Severson, Scottsdale, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Apr. 21, 1975, Ser. No. 569,645

Int. Cl.² H04B *5/00*

U.S. Cl. 179—82 **16 Claims**



1. A receiver system for receiving audio electrical signals, comprising:

means external to a subject's mouth for generating a varying electromagnetic field in response to the audio electrical signals; and

means physically shaped to be easily and removably disposed in the mouth of said subject and being mechanically coupled to the gums for converting said electromagnetic field into mechanical movement to impart motion

through said mouth so that said subject perceives the message content of said audio electrical signals.

3,985,978

METHOD AND APPARATUS FOR CONTROL OF FM BEAT DISTORTION

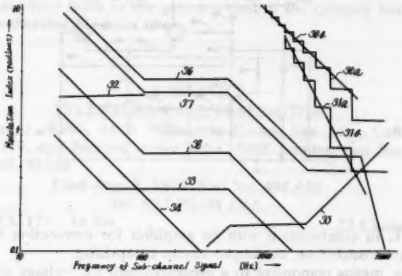
Duane H. Cooper, 918 W. Daniel St., Champaign, Ill. 61820

Continuation-in-part of Ser. Nos. 187,065, Oct. 6, 1971, Pat. No. 3,856,992, and Ser. No. 288,873, Sept. 13, 1972, Pat. No. 3,906,156. This application May 9, 1974, Ser. No. 468,238

Claims priority, application Japan, May 10, 1973, 48-52075

Int. Cl.² G11B 23/18, 3/00

U.S. Cl. 179—100.4 ST **16 Claims**



7. A two channel recording with provision for reduction of crossover modulation distortion having 4-channel audio signals recorded thereon as two main channel and two frequency modulated subchannel signals wherein one main channel and one frequency modulated subchannel are recorded on each channel of the recording and wherein each of said recorded subchannel signals has a modulation index emphasis which corresponds to the recording emphasis of each of said main channel signals.

3,985,979

HALF-ECHO SUPPRESSOR FOR A TERMINAL OF A FOUR-WIRE ELECTRIC LINE

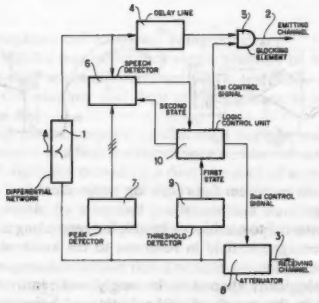
Jean-Michel Durand, Le Kremlin-Bicetre, and Etienne Pénicaud, Chaville, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Dec. 10, 1974, Ser. No. 531,405

Claims priority, application France, Dec. 10, 1973, 73.43928; Nov. 15, 1974, 74.37705

Int. Cl.² H04B 3/20

U.S. Cl. 179—170.6 **10 Claims**



1. Half-echo suppressor for a terminal of a four-wire telephone line having an emitting telephonic signal channel and a receiving telephonic signal channel, comprising:

first means receiving the signal on the emitting channel for blocking this signal or passing it according to a first control signal applied thereto;

second means receiving the signal on the receiving channel for attenuating this signal or passing it unaltered according to a second control signal applied thereto;

third means fed with the signal on the receiving channel downstream from said second means, for generating a first state signal representative of the state of the receiving channel;

fourth means fed with the signal on the receiving channel downstream from said second means, for providing data concerning the amplitude on the receiving channel;

a controlled speech detector means fed with the signal on the emitting channel upstream from said first means, for generating a second state signal representative of the state of the emitting channel, said speech detector means having two operational modes in the first of which said second state signal represents characteristics of amplitude and change in sign on the emitting channel, and in the second of which said second state signal represents a comparison only between the amplitude on the emitting channel and the amplitude on the receiving channel, the data concerning the latter amplitude being that provided by said fourth means; and

logic control means, receiving said first and second state signals, for providing said first and second control signals and for controlling the mode of operation of said speech detector means, the latter operating according to the second mode only when the receiving channel is active and regardless of the state of the emitting channel.

3,985,980

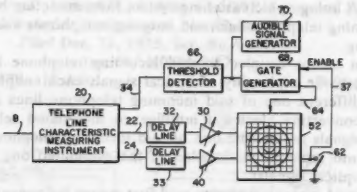
TRIGGERED DISPLAY FOR TELEPHONE LINE CHARACTERISTIC MEASURING INSTRUMENT

Frank R. Bradley, 9 Dash Place, Bronx, N.Y. 10463

Filed Sept. 3, 1975, Ser. No. 609,987

Int. Cl.² H04B 3/46

U.S. Cl. 179—175.3 R **20 Claims**



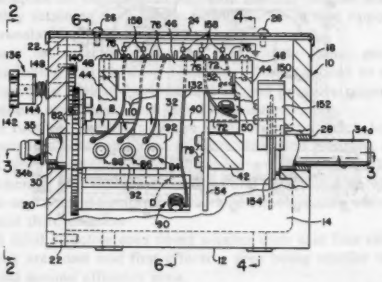
10. An information storage system for use with a transmission path characteristic measuring instrument, said instrument having means for processing a received signal having test tone and disturbance components therein to derive a first signal substantially representative of the instantaneous in-phase component of the total disturbance of interest on the received test tone and a second signal substantially representative of the instantaneous quadrature component of the total disturbance on the received test tone, comprising means having first and second input circuits responsive to the application of signals thereto for selectively storing information, means for detecting a disturbance on said received signal and in response thereto for controlling said storing means to store new information, and means for coupling each of said first and second signals to a respective one of said first and second input circuits at a time delayed relative to said received signal to allow new information to be stored at least in part in accordance with the disturbance on the received signal which was detected by said detecting means.

3,985,981

PROGRAM SWITCH ASSEMBLY HAVING ADJUSTABLE CONTACT STRUCTURE

Richard A. Weirick, Grandville, and Jerry L. Donihue, Battle Creek, both of Mich., assignors to Gulf & Western Manufacturing Company (Hastings), Southfield, Mich.

Filed Mar. 26, 1975, Ser. No. 562,225
Int. Cl.² H01H *19/00*
U.S. Cl. 200—25 **19 Claims**



1. In a rotary switch including a housing, rotor means having an axis and supported in said housing for rotation about said axis, switch contact elements in said housing, means on said rotor means cooperable with said contact elements during rotation of said rotor means to achieve make and break switching functions, and means supporting said contact elements in said housing, the improvement comprising: said supporting means including an arm extending circumferentially of said rotor at least 90° and having axially opposite sides, at least one of said contact elements being circumferentially fixed on said arm, said arm and said one contact being reversible in said housing with respect to the direction of said axis, mounting means for supporting said arm in the reverse positions thereof to selectively position said one contact element in axially aligned and generally diametrically opposed first and second circumferential areas in said housing, and means releaseably interengaging said arm and mounting means for adjusting the position of said arm and thus said one contact element relative to said mounting means in circumferentially opposite directions in each of said first and second areas.

3,985,982

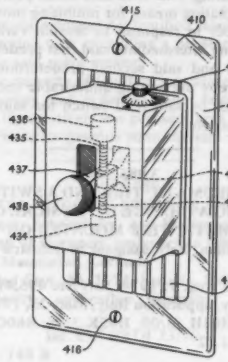
LIGHT SWITCH ACTUATING DEVICE

Carl Schneidinger, 4 Sorell Lane, Rolling Hills Estates, Calif. 90274

Continuation-in-part of Ser. No. 188,235, Oct. 12, 1971, Pat. No. 3,740,680. This application June 15, 1973, Ser. No. 370,401
Int. Cl.² H01H *43/00*
U.S. Cl. 200—33 R **3 Claims**

1. A wall mounted, electrical actuating device comprising:

1. A carrying plate suitable to mount upon the wall of a building; a housing carried by said carrying plate on the side opposite the wall upon which the plate will be mounted; a control knob divided in gradations of time mounted upon said case and connected through the wall of said case to a timing mechanism on the interior of said case; said control knob connected through said case to a mechanism including two timing devices and by which the said timing devices will simultaneously be set; each of said timing devices being connected to an actuating mechanism; an override control knob which extends through an opening in said case from the outside thereof to the inside thereof; each of said actuating mechanisms being in opposed relation to the other actuating mechanism and connected to opposed sides of an extension on said override control knob; and means cooperative with



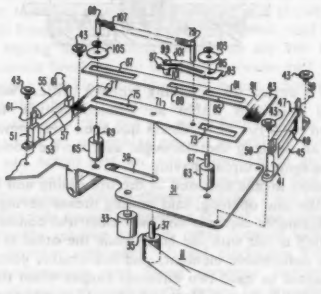
said knob to engage an electrical switch actuating lever upon a wall to which the said plate will be attached.

3,985,983

SWITCH CONTROL APPARATUS FOR RIBBON TENSIONING SYSTEMS

Hilliard R. Di Veto, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 464,736, April 29, 1974, abandoned. This application Jan. 17, 1975, Ser. No. 542,060
Int. Cl.² B65H *25/14*
U.S. Cl. 200—61.18 **16 Claims**



1. In a tension control system wherein a rewind motor is used to control the tension in a medium to be rewound and wherein a reed switch is actuated and deactuated to control the operation of the rewind motor by the removal or insertion of a shunt member at a shunt position disposed between the reed switch and a magnetic flux-generating means in response to the tension in said medium, the improvement comprising:

shunt-positioning means for positioning said shunt member in relation to said reed switch and said magnetic flux-generating means for controlling the actuation and deactuation of said reed switch; and

tension-responsive actuating means responsive to a first predetermined normal tension in said medium for urging said shunt-positioning means to position and shunt member toward said shunt position disposed between said reed switch and said magnetic flux-generating means, said actuating means also responsive to a second predetermined minimum tension in said medium for urging said shunt-positioning means to position said shunt member

away from said shunt position disposed between said reed switch and said magnetic flux-generating means; and

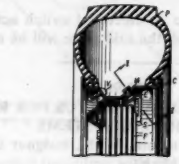
means cooperating with both said shunt-positioning means and said actuating means for inhibiting movement of the shunt member in response to tension variations in said medium being intermediate said first predetermined normal tension and said second predetermined minimum tension thereby preventing undesirable recycling of said rewind motor by said reed switch for said intermediate tension variations.

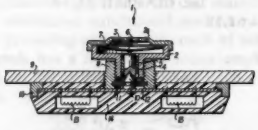
3,985,984

RIM FOR A PNEUMATIC TIRE AND A SWITCH DEVICE FOR SIGNALING A CHANGE IN PHYSICAL CONDITIONS IN A PNEUMATIC TIRE MOUNTED ON THE RIM

Giulio Cappa, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Aug. 7, 1974, Ser. No. 495,411
Claims priority, application Italy, Mar. 23, 1973, 28118/73
Int. Cl.² H01H *35/00*; H05K *3/28*; B60C *23/00*
U.S. Cl. 200—61.22 13 Claims





1. In a device for detecting when a critical value of the physical condition within an inflated vehicle tire casing mounted on a rim of a vehicle has been overcome, said rim having an opening therethrough, said device comprising an electromagnetic circuit having

a sensing means disposed in the tire casing and connected to the said opening, said sensing means having a body, a deformable element and two electrical contacts, one of which is fast with the body while the other is applied to the deformable element, said deformable element being adapted to have two different shapes when the physical condition changes from one value to another value across the critical value, said electrical contacts being contacted when said deformable element has one of the said shapes but not when the element has the other shape,

an electrical circuit disposed on said rim adjacent to the opening and on the wall of the rim outside the said casing, said electrical circuit being embedded in a resinous adhesive material which secures said circuit to the rim, said electrical circuit being inductively coupled to a means for signaling said overcoming of the critical value responsive to current flow in said electrical circuit, and

conductor means to electrically connect two suitable points of said electrical circuit with said two electrical contacts of the sensing means,

the improvement wherein

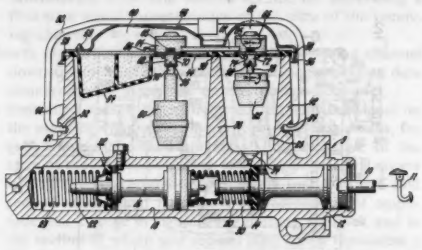
said electrical circuit is arranged exactly corresponding to the opening on the rim so that said opening is completely covered, whereby said resinous adhesive material fills the opening in an air-tight manner and insulates said sensing means and said conductor means from the outside of the tire casing and rim assembly.

3,985,985

BRAKE FLUID LEVEL SENSING SYSTEM

Duane H. Harwick, and Michael M. Schardt, both of Kettering, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1975, Ser. No. 569,882
Int. Cl.² H01H *35/18*
U.S. Cl. 200—81.4 2 Claims



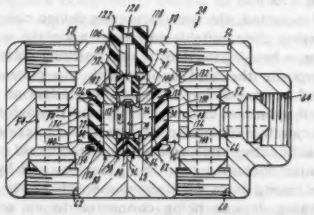
1. A hydraulic brake fluid level sensing system for use with a hydraulic vehicle brake system having a brake fluid reservoir, said system comprising: a cover member for enclosing the reservoir; a diaphragm positioned between the cover member and the fluid reservoir, the diaphragm and the cover member forming a chamber therebetween; means for venting the chamber to the atmosphere; and fluid level sensor means responsive to fluid level variations in the reservoir, said fluid level sensor means including a stationary guide means extending from the chamber to the reservoir through the diaphragm, the diaphragm normally sealingly engaging the periphery of the stationary guide means and sealingly engaging the reservoir to normally seal the reservoir from the chamber, the diaphragm being moved down the stationary guide means by differential pressure thereacross resulting from a decrease in brake fluid level in the reservoir, the stationary guide means having a slot therein proximate the end thereof in the reservoir, whereby movement of the diaphragm down the stationary guide by the differential pressure thereacross resulting from loss of brake fluid is limited by venting of the reservoir to atmosphere when the diaphragm is moved to a position over the slot in the stationary guide means.

3,985,986

DIFFERENTIAL PRESSURE WARNING SWITCH

Roger E. Doerfler, Detroit, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Oct. 24, 1974, Ser. No. 517,508
Int. Cl.² H01H *35/38*, *35/34*
U.S. Cl. 200—82 D 16 Claims



1. A differential pressure warning device comprising a housing defining a chamber,

means communicating first and second fluid pressure sources with said chamber,

shuttle piston means movable within said chamber between opposed translated positions in response to differential pressure conditions existing between said sources,

detent means for retaining said shuttle piston means in said opposed translated positions,

said detent means including an annular ring carried on said shuttle piston means,

means disposed around the periphery of said chamber adapted for engagement with said annular ring for releasably retaining said shuttle piston means in said opposed translated positions,

means for selectively moving said shuttle piston means including first pressure response means exposed to said first fluid pressure source and second pressure response means exposed to said second pressure source,

said first and second pressure response means each being movable between a first position, a second position, and a third position and each having a first effective area when in said first position, a second effective area when in said second position, and a third effective area when in said third position

said third effective area being smaller than said first effective area and said first effective area being smaller than said second effective area,

means responsive to movement of said shuttle piston means for completing an electrical circuit and providing a warning signal.

3,985,987

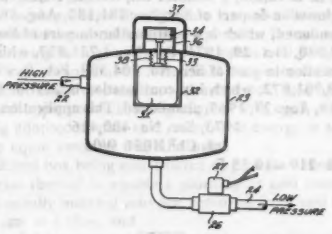
MEANS FOR RECYCLING LIQUIFIED INSULATING GAS IN A GAS INSULATED CIRCUIT BREAKER

Amrut R. Patel, Brandon, Miss., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed July 31, 1975, Ser. No. 600,782

Int. Cl.² H01H *33/57*

U.S. Cl. 200—148 E **6 Claims**



1. In a gas insulated circuit breaker including a gas sealed enclosure having insulating gas at a relatively low pressure therein and in which an interrupter and an associated blast valve unit is disposed;

a storage tank having insulating gas at a relatively high pressure therein for arc interruption, said storage tank being operably connected to supply insulating gas at relatively high pressure to the blast valve unit;

a collecting tank external of the enclosure, said collecting tank having an inlet and an outlet;

first conduit means connected to said storage tank and to the inlet of said collecting tank to drain liquified insulating gas at a relatively high pressure from said storage tank into said collecting tank;

second conduit means connecting the outlet of said collecting tank to the enclosure for directing the collected liquified insulating gas from said tank to enclosure wherein the liquified insulating gas returns to its gaseous state;

valve means on the outlet side of the collecting tank and normally operable to block the flow of liquified insulating gas through said second conduit means, said valve means being operable when actuated to permit the flow of liquified insulating gas through said second conduit means; and,

operable means actuated by liquified insulating gas within said collecting tank exceeding a predetermined quantity to actuate said valve means;

whereby the quantity of liquified insulating gas collected in said collecting tank is forced under relatively high pressure into the relatively low pressure area of the enclosure and returns to its gaseous state therein.

3,985,988

ELECTRIC CIRCUIT BREAKER ASSEMBLY

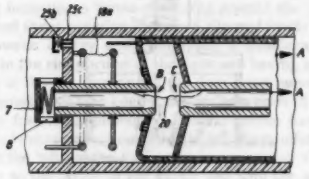
Gerhard Körner, Schriesheim, and Wolfgang Schmitz, Affolterbach, both of Germany, assignors to BBC Brown Boveri & Cie AG, Mannheim, Germany

Filed Sept. 30, 1974, Ser. No. 510,717

Claims priority, application Germany, Oct. 1, 1973, 2349263

Int. Cl.² H01H *33/70*

U.S. Cl. 200—148 R **21 Claims**



1. An electrical circuit breaker assembly comprising, in combination, a pair of contact elements movable relative to each other to effect making and breaking of a circuit having said circuit breaker assembly connected therein, said contact elements having defined therebetween an arc site through which a circuit breaking arc is struck between said contact elements upon breaking of said circuit, means defining an arc quenching chamber surrounding said arc site, an arc quenching gas contained within said arc quenching chamber, means for passing said arc quenching gas out of said arc quenching chamber and across said arc site to quench an arc struck between said contact elements upon breaking of said circuit, means defining an auxiliary chamber having a gas contained therein, electrode means comprising at least one pair of electrodes movable relative to each other located within said auxiliary chamber with each of said electrodes having an annular configuration and being arranged concentrically about one of said contact elements, means for imparting to at least one of said contact elements a force derived from pressure within said auxiliary chamber tending to move said contact elements relative to each other in a circuit breaking direction, means for connecting said electrode means within said circuit in series with said contact elements, and means for moving said at least one pair of electrodes relative to each other in association with said contact elements, said electrodes being in abutting relationship when said contact elements are in abutting relationship to close said circuit, with separation of said electrodes to effect striking of a secondary arc thereacross occurring simultaneously with separation of said contact elements, said electrodes being shaped to cause said secondary arc to move while being struck therebetween along a generally annular path coincident with said annular configuration of said electrodes around said one of said contact elements, said secondary arc when of sufficient magnitude being operative to increase pressure in said auxiliary chamber to impart to said contact elements a force derived from said increased auxiliary chamber pressure assisting movement of said contact elements in a circuit breaking direc-

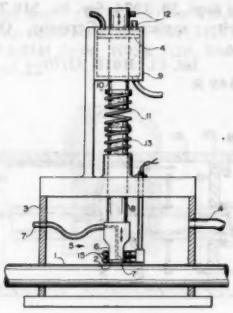
tion thereby to provide power for quenching of current intensities through said circuit breaker substantially to the level of rated current therethrough in order to ensure quenching of an arc at said arc site sufficient to effect cutoff of rated current through said breaker.

3,985,989

METHOD AND APPARATUS FOR JOINING APPENDAGES TO A ZIRCONIUM ALLOY MEMBER

Anthony K. C. Ip, and Kenneth Koyanagi, both of Peterborough, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Aug. 15, 1975, Ser. No. 605,058
Claims priority, application Canada, Sept. 13, 1974, 209222
Int. Cl.² H05B 5/08
U.S. Cl. 219—9.5 **5 Claims**



1. A method of joining a zirconium alloy appendage to a zirconium alloy member comprising:
   a. depositing a coating of material that will form a eutectic with a zirconium alloy onto the joning surface of the appendage;
   b. heating the appendage in a non-oxidizing environment to a temperature sufficient to form a eutectic composed of the coating material and zirconium alloy of the appendage, and simultaneously heating the member in the region to be joined to a temperature below the transformation temperature thereof;
   c. bringing the heated appendage and the member together to effect joining; and
   d. continuing heating of the joined appendage and member, whereby the temperature of the member remains below the transformation temperature, in order to complete the joining process.

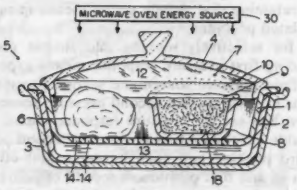
3,985,990

MICROWAVE OVEN BAKING UTENSIL

Melvin L. Levinson, 1 Meinzer St., Avenel, N.J. 07001

Continuation-in-part of Ser. Nos. 400,416, Sept. 24, 1973, Ser. No. 391,146, Aug. 23, 1973, Pat. No. 3,854,023, and Ser. No. 325,330, Jan. 22, 1973, Pat. No. 3,881,027, said Ser. No. 400,416, and Ser. No. 391,146, each is a continuation-in-part of Ser. No. 381,182, Aug. 16, 1972, abandoned, said Ser. No. 325,330, is a division of Ser. No. 193,940, Oct. 29, 1971, Pat. No. 3,731,037. This application Dec. 3, 1974, Ser. No. 529,052
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 E **16 Claims**

1. For use in the heating of an article in a microwave oven, an improved heating member comprising:
   a microwave-reflective first body with at least one heat-conductive section where said section is bounded by an obverse surface and a reverse surface and where said obverse surface is designed to receive said article essentially in contact thereon and thereby partially shield, from exposure to microwave energy, an adjacent first portion of said article while said exposure to microwave energy heats a second portion of said article remote from said obverse surface,
   a microwave-reflective second body which connects with said reverse surface of said first body to form a microwave-shielded, steam-condensing chamber therebetween,
   a microwave-permeable, steam-confining third body which connects with said obverse surface to form a steam confining, heating chamber therebetween, and



   a microwave-non-permeable, steam-permeable means connecting said steam-confining chamber to said steam-condensing chamber.

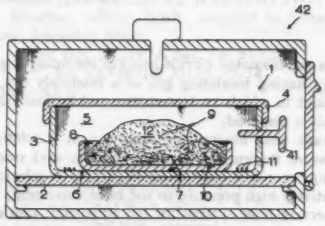
13. A microwave heating utensil comprising:
   a condensation chamber formed of microwave-reflective material and having an outer steam-permeable, heat-conducting surface for supporting, essentially in contact thereon, a food product, and
   a cover covering at least the outer food supporting surface of said condensation chamber, said cover being steam impermeable to impede the escape of steam from said utensil.

3,985,991

METHODS OF MICROWAVE HEATING IN METAL CONTAINERS

Melvin L. Levinson, 1 Meinzer St., Avenel, N.J. 07001

Continuation-in-part of Ser. No. 281,182, Aug. 16, 1972, abandoned, which is a continuation-in-part of Ser. No. 193,940, Oct. 29, 1971, Pat. No. 3,731,037, which is a continuation-in-part of Ser. No. 704,389, Feb. 9, 1968, Pat. No. 3,701,872, which is a continuation-in-part of Ser. No. 483,144, Aug. 27, 1965, abandoned. This application Sept. 24, 1973, Ser. No. 400,416
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 E **15 Claims**



1. In a method of heating an article in a microwave oven the steps which include:
   locating said article in thermal contact with an obverse surface of a microwave-shielding, heat-conductive container to partially shield an area of said article in said thermal contact with said obverse surface from direct exposure to microwave energy and to leave unshielded from said direct exposure to microwave energy a second area remote from said obverse surface.

locating microwave-permeable, liquid-absorptive body at the-complementary-reverse-surface-of-said-obverse-surface of said container to absorb liquid condensation from said reverse surface and transport said liquid condensation away from the microwave shielding action of said reverse surface to a location exposed to microwave energy, and

exposing said article, container and absorptive body to microwave energy within said microwave oven.

3,985,992

MICROWAVE HEATING TRAY

Costas E. Goltsos, Weston, Mass., assignor to Teckton, Inc., Wellesley, Mass.

Continuation of Ser. No. 373,931, June 27, 1973, abandoned, which is a continuation-in-part of Ser. No. 167,185, July 29, 1971, abandoned. This application July 17, 1974, Ser. No. 489,140

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 E **18 Claims**

1. An apparatus for heat conditioning a meal with microwave energy comprising, in combination:

a tray formed from a material which is transparent to said energy;

means defining a plurality of compartments in said tray for retaining a plurality of different foods in predetermined relative locations on said tray;

a control box having a pair of opposite walls and formed from a material which is opaque to said microwave energy, said control box being receptive to said tray between said walls;

means forming at least one aperture in each of said opposite walls of said control box, said apertures in said opposite walls being in registry with each other and with one of said tray compartments when said tray is contained in a predetermined orientation within the box, said apertures in said opposite walls being aligned with each other and being adapted to pass said microwave energy in substantially equal amounts therethrough;

said control box being constructed to provide access to the interior thereof to enable a plurality of said trays to be sequentially inserted into and removed from said control box one at a time; and

said control box and said tray including interfering means cooperative to substantially preclude insertion of said tray into said control box when said tray is in other than said predetermined orientation.

16. A tray adapted to contain various foods of a complete meal comprising:

a bottom wall and a sidewall surrounding said bottom wall and extending upwardly therefrom;

said bottom wall being formed to define at least one upwardly extending ridge within said tray to define a plurality of tray compartments, said walls and ridges being formed from a material transparent to energy of a character adapted to heat condition foods;

a film transparent to said radiation and extending over said tray and being connected to said tray at least along the upper surface of said sidewall;

said ridges being of a height which is less than that of said sidewall, said film being sufficiently flexible to enable it to be pressed downwardly into said tray and against the upper surfaces of said at least one ridge thereby to isolate each of said tray compartments from each other when desired.

3,985,993

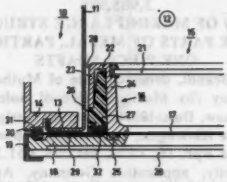
SEALING ARRANGEMENT IN A MICROWAVE OVEN

Bengt Uno Imberg; Kurt Hakan Karlsson, and Gustav Georg Orke, all of Norrkoping, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1974, Ser. No. 501,481

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 D **11 Claims**



1. A sealing arrangement in a microwave oven having an oven cavity defined by side walls of electrically conductive material and conductive wall portions defining a substantially rectangular access opening, a door for closing said access opening including a frame extending around the door and a perforated sheet covering the space situated inside the frame, a microwave energy seal comprising a quarterwave choke located in the rim portion of the door and having an entrance opening in the rim portions of the door lying opposite to and spaced apart from said conductive wall portions of the cavity, the door frame comprising an integral profile having a substantially U-shaped section of an electrically conductive material with the base of the U, as seen in a sectional view, facing inwardly to the inside of the cavity and with the outer leg of the U forming a portion of the rim portions of the door and being shorter than the inner leg of the U, said perforated sheet being arranged in a plane with the outer end of the inner leg, and means electrically connecting said sheet with said end of the longer inner leg with the sheet extending beyond the inner and the outer legs of the U so that the entrance opening to the choke is formed by the intermediate space between the sheet and the outer shorter leg of the U-shaped profile of the door frame.

3,985,994

DRAIN PIPE STERILIZATION

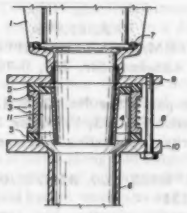
Kalevi Eloranta; Raimo Lindroos, both of Rauma, and Jorma Surakka, Savonlinna, all of Finland, assignors to K. Oras Oy, Rauma, Finland

Filed Dec. 2, 1974, Ser. No. 526,524

Claims priority, application Finland, Nov. 26, 1973, 3642/73

Int. Cl.² H05B *1/00*; E03C *1/28*; A61L *1/00*

U.S. Cl. 219—201 **5 Claims**



1. In a wash basin having an outlet pipe and a drain pipe: a connecting pipe portion fluid-tightly connecting the outlet pipe to the drain pipe and comprising a metal ring mounted between the outlet pipe and the drain pipe, an electric resistance heating coil surrounding the connecting pipe portion

and wound on the metal ring, the heating coil being adapted to heat the interior of the connecting pipe portion to an elevated temperature sufficiently high to prevent microbes from rising through the connecting pipe portion from the drain pipe into the outlet pipe and thermal insulating means mounted between the metal ring and the outlet and drain pipes for insulating said ring from said outlet pipe and said drain pipe.

3,985,995

METHOD OF MAKING LARGE STRUCTURAL ONE-PIECE PARTS OF METAL, PARTICULARLY ONE-PIECE SHAFTS

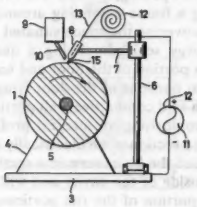
Hermann Th. Brandi, deceased, late of Mulheim-Ruhr-Speldorf, Germany (by Marianne Brandi, sole heiress), and Herbert Luckow, Dusseldorf, Germany, assignors to August Thyssen-Hutte Aktienges., Duisburg-Hamborn, Germany

Filed Apr. 16, 1974, Ser. No. 461,343

Claims priority, application Germany, Apr. 19, 1973, 2320186; Dec. 24, 1973, 2364495

Int. Cl.² B23K 9/04

U.S. Cl. 219—76 **11 Claims**



1. A method for manufacturing relatively large integrated structural parts of metal, particularly unitary shafts for turbines and electrical generators, said method comprising the steps of providing an initial support member, depositing on said support member an initial layer of weld metal by a welding operation consisting essentially of formation of weld beads in the absence of cooling in the area of said weld beads along contiguous tracks to form said initial layer as a continuous layer of deposited weld metal formed by said weld beads, and depositing a plurality of further continuous superposed layers of weld metal in separate succeeding welding operations each consisting essentially of formation of weld beads in the absence of cooling in the area of said weld beads, said depositing being conducted to form each of said initial and further superposed layers as separate discrete layers of weld metal individually separately formed in succeeding welding operations to manufacture said large integrated structural part essentially exclusively of said support member and said discrete separately formed superposed layers of weld material.

3,985,996

THERMAL CUTTING APPARATUS

Artur Fischer, Altheimer Str. 219, D-7241 Tumlingen, Germany

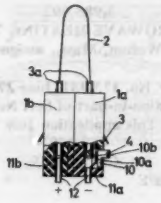
Continuation-in-part of Ser. No. 522,931, Nov. 11, 1974. This application Feb. 13, 1975, Ser. No. 549,023

Claims priority, application Germany, Nov. 17, 1973, 2357527

Int. Cl.² H05B 1/00; B26D 7/10; B26F 3/12

U.S. Cl. 219—221 **9 Claims**

1. A cutting apparatus for cutting shapes in workpieces, particularly synthetic plastic foam material, comprising an electrically conductive, resistive wire having spaced end portions and being bendable to form a desired workpiece-cutting configuration but being stiff enough to retain the wire in said configuration to which it has been bent; a pair of electrically non-conductive, wire-positioning elements each connected to a respective one of said wire end portions, said elements being independently movable so that they may be successively moved and positioned to form said wire into said configuration requisite for cutting different shapes into a workpiece; means for supplying electrical current to said wire so as to form an electrical circuit path for heating said wire to a predetermined cutting temperature, said current supplying means including an electric switch provided in said path adjacent one of said spaced end portions of said wire and operative to close



said circuit path; a pair of extension members; and mounting means for connecting said extension members with said elements, said current supplying means further including a pair of cooperating electrically-conductive pins and sockets on respective ones of said elements and extension members for establishing a mechanical and electrical interconnection therebetween and an electrically conductive terminal on each of said extension members electrically connected to the pin and socket interconnection between the member and its associated element.

3,985,997

METHOD AND APPARATUS FOR CUTTING CLOTH

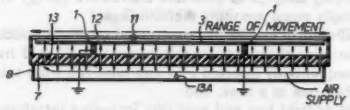
John Charles Burley, 47A Southwick St., Southwick, Brighton, Sussex, England (BN4 4TH)

Continuation-in-part of Ser. No. 442,582, Feb. 14, 1974, abandoned. This application Dec. 2, 1974, Ser. No. 529,001

Claims priority, application United Kingdom, Feb. 14, 1973, 7166/73

Int. Cl.² H05B 7/18

U.S. Cl. 219—384 **5 Claims**

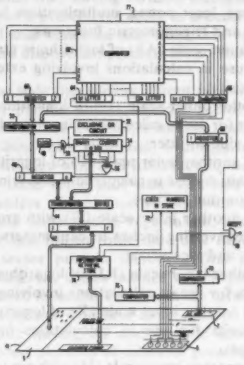


1. Apparatus for severing a portion of given shape from a piece of cloth which comprises electrical means for generating a succession of high voltage impulses at a pair of output terminals for producing electrical spark discharges, a stationary lower electrode following the periphery of said given shape and electrically connected to one output terminal of the generating means, an apertured electrically insulating plate for supporting said first electrode closely adjacent to one face of a piece of cloth, means for directing an upward current of air through the apertures in said insulating plate beneath said cloth so that said cloth is maintained substantially flat on said lower electrode, an upper elongated movable electrode electrically connected to the other output terminal of the generating means, means for supporting said upper electrode for movement parallel to said first electrode closely adjacent the other face of said piece of cloth and arranged to enable electrical spark discharges to be passed between said electrodes through the cloth to cut from said cloth a portion having the shape of said enclosed area, and means for supporting said piece of cloth between the upper and lower electrodes.

3,985,998
PERSONAL AUTHORITY VERIFICATION SYSTEM

Paul A. Crafton, Potomac, Md., assignor to Century International Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 90,756, Nov. 18, 1970, abandoned. This application Aug. 17, 1973, Ser. No. 389,086
Int. Cl.[2] G06K 5/00; G07F 7/02
U.S. Cl. 235—61.7 B 20 Claims



12. A method for automatically verifying the authority of a person executing a document comprising the steps of:

a. assigning to persons having authority a unique code name,

b. providing a randomly generated alphabet display comprising a randomly generated mark or space for each letter of the alphabet,

c. recording on said document a code signature comprising a series of marks and spaces corresponding to said code name as determined by said alphabet display, said code name and alphabet display forming indicators of authority,

d. reading said code signature from said document, and

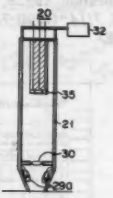
e. electronically comparing the code name with the code signature and the alphabet display to determine correspondence between the code name and the code name represented by the code signature.

3,985,999
CODE READOUT APPARATUS

Tsuneo Yoneyama, Yokosuka, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 21, 1974, Ser. No. 453,294
Claims priority, application Japan, Mar. 26, 1973, 48-33498
Int. Cl.[2] G06K 7/10; E04G 17/00
U.S. Cl. 235—61.11 E 2 Claims

1. A code readout apparatus for reading out information indicated in the form of broad and narrow marks and intervening broad and narrow blanks juxtaposed in the scanning direction, which comprises a readout head having a first detector for reading out an output representing the central area of an image on the illuminated surface of a recording medium and converting said output into an electrical signal, and a second detector for reading out an output denoting the peripheral area of said image and converting said output into an electric signal; a judgment circuit provided with means for indicating a difference between outputs from the first and second detectors and means for judging from said difference whether the marks and blanks are broad or narrow, the first and second detectors each being provided with a semiconductor device received in the readout head and formed of a large number of juxtaposed PN junctions, the central one of which is supplied with light reflected from the central area of an image on the

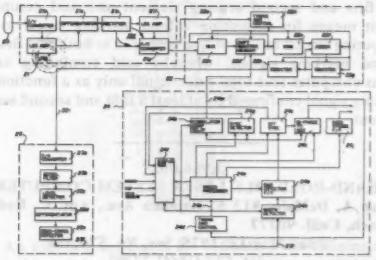


surface of a recording medium and all the junctions of which are supplied with light reflected from the peripheral portion of said image.

3,986,000
LOGARITHMICALLY NORMALIZED CROSS-CORRELATION BAR-CODE READER

Robert B. McJohnson, Dallas, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Filed Aug. 1, 1975, Ser. No. 601,317
Int. Cl.[2] G06K 7/08; G06F 15/34
U.S. Cl. 235—61.11 E 18 Claims



1. In reading bar-code data in the presence of noise where an analog output signal from a bar-code sensor exhibits amplitude variations dependent upon presence and absence of bars in data fields transported past said sensor as well as upon differences in backgrounds of said fields, and where an expected response to each such bar is of known waveform, the steps of:

a. normalizing said output signal to minimize said variations;

b. converting the normalized signal to a digital signal at a sample interval small compared to the period of said known waveform;

c. storing a digital reference set of products formed by multiplying each quantization level of said digital signal by each sample of said known waveform taken at said sample interval;

d. for each sample interval along said output signal selecting members of said reference set dependent upon the sample interval of said known waveform and the amplitude of said digital signal, and summing selected ones of said members for a plurality of adjacent sample intervals along said output signal to form one point on a correlation output function; and

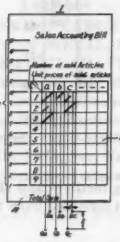
e. continuously sensing said correlation output function for the presence of predetermined bar dependent characteristics.

3,986,001

SALES COMPUTER UTILIZING SENSOR PAIRS

Yutaka Saito, Kyoto, Japan, assignor to Toaseiko Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 392,087, Aug. 23, 1973, abandoned. This application Aug. 8, 1975, Ser. No. 603,025
Int. Cl.[2] G06K 7/14; G09B 7/02; G06K 19/06
U.S. Cl. 235—61.11 E 8 Claims



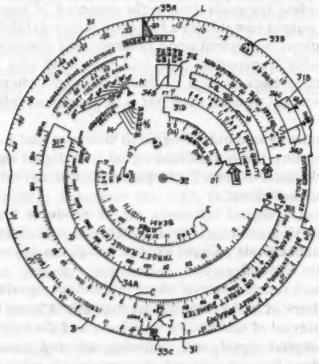
1. In a computing system adapted to process cards having at least one mark indicative of the number of items sold at a given unit price, and having a first sensing element for sensing a portion of said mark and furnishing a first marking signal in response thereto, and having computing circuit means for computing the total price as a function of said first marking signal and said given unit price, the improvement, comprising, in combination, a second sensing element sensing a second part of said mark and furnishing a second marking signal in response thereto; logic circuit means interconnected between said first and second sensing element and said computing circuit means for furnishing a final marking signal to said computing circuit means only in response to both said first and second marking signals, whereby said computing circuit means computes said total price signal only as a function of a marking signal confirmed by at least a first and second sensing element.

3,986,002

HAND-HOLDABLE LASER SYSTEM COMPUTER

Dorian A. DeMaio, 813 S. Catalina Ave., Apt. C, Redondo Beach, Calif. 90277

Filed May 12, 1975, Ser. No. 576,486
Int. Cl.[2] G06C 27/00
U.S. Cl. 235—78 R 7 Claims



1. A multi-purpose, hand-holdable laser computer in the form of a circular slide rule, comprising:

a. an opaque circular stator having a front face, a rear face, a geometric center, a diameter, and a plurality of different preselected scales suitably disposed in arcuate configuration on said front face and on said rear face at predetermined fixed locations thereon, wherein said plurality of said different preselected scales at predetemined fixed locations on said front face of said circular stator include, from the most radially remote inward toward said geometric center of said stator:

1. an outermost scale (A) of logarithmic graduations in units for use in calculations involving incident intensity, peak intensity, ideal flux, incident energy fluence, total absorbed energy, received power, received sensor power, laser power, multiplication, logarithms, squaring, and trigonometric functions;
2. an inner scale (A1) of logarithmic graduations in units for use in calculations involving extended power and intensity;
3. another inner scale (U) of logarithmic graduations in units for use in calculations involving intensity degradation due to jitter;
4. still another inner scale (T) of logarithmic graduations in units for use in calculations involving intensity degradation due to jitter;
5. yet another inner scale (G) with graduations in units for converting inches to centimeters, and feet to meters, and vice versa;
6. another inner scale (R1) of logarithmic graduations in units for use in calculations involving squaring;
7. still another inner scale (X) of logarithmic graduations in units for use in calculations involving Rayleigh range;
8. yet another inner scale (H) with graduation in units for converting nautical miles and statute miles to kilometers and vice versa;
9. another inner scale (R) of logarithmic graduations in units for use in calculations involving beam spread angle and reciprocals;
10. an innermost scale (V) of logarithmic graduations in units for use in calculations involving beam spread due to diffraction;
11. and, another innermost scale (W) of logarithmic graduations in units for use in calculations involving a Rayleigh range;

b. a first rotor slide disc having a front face, a geometric center, and a diameter smaller than said diameter of said circular stator, with said first rotor slide disc positioned front-face-up on said front face of said circular stator with the respective said geometric centers of said circular stator and of said first rotor slide disc in registration, and with said first rotor slide disc also having on said front face thereof an arcuately configurated notch and a plurality of different arcuately configurated slots, wherein said notch and said slots are suitably disposed on said front face of said first rotor slide disc at predetermined fixed locations thereon, and with said first rotor slide disc further having on said front face thereof a plurality of different preselected scales suitably disposed on said front face at predetermined fixed locations thereon in arcuate configuration, with said notch, said slots, and said scales on said front face of said first rotor slide disc usable complementarily with, and cooperatively with, said scales on said front face of said circular stator;

c. an opaque second rotor slide disc having a front face, a geometric center, and a diameter smaller than said diameter of said circular stator, with said second rotor slide disc positioned with said front face up on said rear face of said circular stator with the respective said geometric centers of said circular stator and of said second rotor slide disc in registration, and with said second rotor slide disc also having on said front face thereof a plurality of different graph-like preselected scales of sets of curve-like lines suitably disposed on said front face at predetermined fixed locations thereon;

d. a third rotor slide disc having a front face, with an opaque sector portion and a transparent sector portion, a geomet-

ric center, and a diameter smaller than said diameter of said second rotor slide disc, with said third rotor slide disc positioned with said front face up on said front face of said second rotor slide disc with said respective geometric centers of said third rotor slide disc and of said second rotor slide disc in registration, and with said third rotor slide disc also having on said opaque sector portion of said front face thereof a plurality of different preselected scales in arcuate configuration and a plurality of graph-like scales of sets of curved-like lines, and also with said third rotor slide disc having on said transparent sector portion thereof a preselected scale in arcuate configuration, with all said scales on said front face of said third rotor slide disc disposed at predetermined fixed locations thereon;

e. a fourth rotor slide disc having a front face with a transparent sector portion and an opaque sector portion, a geometric center, and a diameter smaller than said diameter of said third rotor slide disc, with said fourth rotor slide disc positioned with said front face up on said front face of said third rotor slide disc with said respective geometric centers of said fourth rotor slide disc and of said third rotor slide disc in registration, and with said front face of said fourth rotor slide disc having on said transparent sector portion thereof a first plurality of different preselected scales marked and disposed at predetermined fixed locations thereon in the form of radially extending lines, and with said front face of said fourth rotor slide disc having on said opaque sector portion thereof a second plurality of different preselected scales disposed at predetermined fixed locations thereon in arcuate configuration;

f. a transparent foldable cursor having two ends with a pivot like hole at and in each end, a top surface with a radially disposed hairline marked thereon, and a bottom surface, and being of a length longer than said diameter of said circular stator, with said cursor folded at half-length and positioned so that said bottom surface of one half-length is on top of and abuts the front face of said fourth rotor slide disc, also positioned so that said bottom surface of said other half-length is on top of and abuts said front face of said first rotor slide disc, and said pivot holes are directionally opposed;

g. and, a removable, centrally located pivot connecting said circular stator, said first rotor slide disc, said second rotor slide disc, said third rotor slide disc, and said fourth rotor slide disc to each other and together at their respective geometric centers, and with said pivot also connecting said cursor to said circular stator and to said rotor slide discs, whereby said cursor and said rotor slide discs are pivotally secured and are independently rotatable about and on said pivot.

3,986,003

MULTI POSITION SOLID STATE TOUCH SWITCH

Manfred K. Pruessner, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 21, 1975, Ser. No. 560,833
Int. Cl.² H03K *21/08*
U.S. Cl. 235—92 EA **8 Claims**

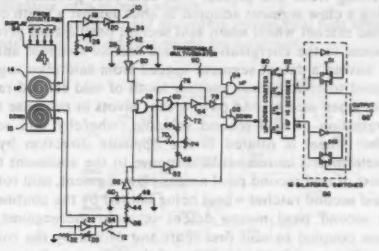
1. A solid state touch activated multi-position switch comprising:

at least one normally-on oscillating oscillator;

a touch capacitor coupled to the input of said oscillator wherein touching said capacitor causes said oscillator to cease oscillating, causing said oscillator to provide a logical output as a switching criterion;

logic circuitry coupled to the output of said oscillator to receive said logical output;

an up-down counter coupled to the output of said logic circuitry to be stepped by the output of said logic circuitry; and



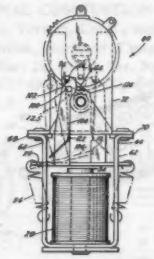
means coupled to the output of said up-down counter for decoding said up-down counter to select a desired switch.

3,986,004

INDEXING APPARATUS FOR DICTATING AND TRANSCRIBING SYSTEMS

James C. Whitney, Fairfield, Conn., assignor to Dictaphone Corporation, Rye, N.Y.

Filed Dec. 27, 1974, Ser. No. 536,857
Int. Cl.² G06M *3/14*; **G11B** *15/18*
U.S. Cl. 235—92 EV **4 Claims**



1. An indexing apparatus for indicating the difference between the number of occurrences of a first predetermined characteristic and the number of occurrences of a second predetermined characteristic as represented by first and second pulse signals, respectively, comprising: a housing; first and second solenoids mounted in said housing for receiving said first and second pulse signals, respectively; a bracket disposed on said housing; a first shaft journaled for rotation in said bracket; first and second ratchet wheels secured to said first shaft in spaced apart relation thereon; first pawl means pivotally mounted in said housing and having a first portion disposed over said first solenoid so as to pivot said first pawl means when said first solenoid is energized by said first pulse signals, said first pawl means having a leg extending from and pivotal with said first portion, said leg having a claw segment adapted to abut against tooth of said first ratchet wheel when said first pawl means pivots in response to the energization of said first solenoid and further having a detent segment spaced from said claw segment adapted to abut against another tooth of said first ratchet wheel when said first pawl means pivots in response to the energization of said first solenoid, whereby said first ratchet wheel is rotated in one direction by a predetermined increment in response to the abutment thereagainst of said first pawl means claw segment, said rotation being limited by the abutment of said first pawl means detent segment against said first ratchet wheel; second pawl means pivotally mounted in said housing and having a first portion disposed over said second solenoid so as to pivot said second

pawl means when said second solenoid is energized by said second pulse signals, said second pawl means having a leg extending from and pivotal with said first portion, said leg having a claw segment adapted to abut against a tooth of said second ratchet wheel when said second pawl means pivots in response to the energization of said second solenoid and further having a detent segment spaced from said claw segment adapted to abut against another tooth of said second ratchet wheel when said second pawl means pivots in response to the energization of said second solenoid, whereby said second ratchet wheel is rotated in the opposite direction by said predetermined increment in response to the abutment thereagainst of said second pawl means claw segment, said rotation of said second ratchet wheel being limited by the abutment of said second pawl means detent segment thereagainst; and means coupled to said first shaft and driven by the rotation thereof to provide an indication of the difference between the number of received first and second pulse signals.

3,986,005

ODOMETER FOR AN AUTOMOBILE

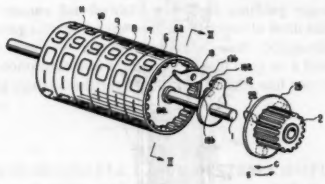
Akira Itoh, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 22, 1974, Ser. No. 517,061

Claims priority, application Japan, Nov. 8, 1973, 48-129661[U]

Int. Cl.² G01C *22/00*

U.S. Cl. 235—96 **5 Claims**



1. An odometer for an automobile comprising:

a drive gear to which wheel rotation is transmitted,

a shaft,

a plurality of numbered wheels carried rotatably by said shaft for accumulating the running distance of the automobile with the least significant digit wheel having internal gear teeth formed on the inner periphery thereof,

wherein the improvement comprises:

a cam holder rotatably carried by said shaft and disposed between said least significant digit wheel and said drive gear, and

a cam pivotably mounted at a pivot point on said cam holder between said shaft and said internal gear teeth and so formed at one end extending from the pivot point as to mate with said internal gear teeth and cause rotation of said numbered wheels, and

wherein said drive gear is provided with a disc plate having at least a pair of projections including a first projection for engaging said cam to pivot said cam in a first direction to cause said one end of said cam to mate with said internal gear teeth when the automobile runs forward, and a second projection for engaging said cam to cause said cam to pivot in a direction opposite to said first direction and disengage said one end from said internal gear teeth when the automobile runs backward.

3,986,006

FUEL INJECTION CONTROLLING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

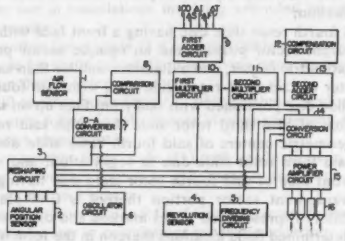
Hisasi Kawai, Toyohashi, and Ritsu Katsuoka, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 31, 1975, Ser. No. 563,445

Claims priority, application Japan, June 5, 1974, 49-64454

Int. Cl.² G06F *15/20*; F02D *33/00*

U.S. Cl. 235—150.21 **5 Claims**



1. In a fuel injection controlling system for an internal combustion engine in which a fuel injection quantity K.Q/N is computed in accordance with an air flow rate Q, an engine rpm N and a constant K corresponding to the air-to-fuel ratio of a mixture, which rate Q, rpm N and constant K constitute principal parameters of said engine, the improvement comprising:

an oscillator circuit for generating clock pulses having a predetermined frequency;

first sensing means for generating a pulse signal having a time width proportional to said air flow rate Q;

a first multiplier circuit connected to said oscillator circuit and said first sensing means for repeatedly adding a predetermined binary coded value in response to said clock pulses, the number of times of the addition in said first multiplier circuit being controlled by said pulse signal from said first sensing means, and for generating a binary coded output signal proportional to the air flow rate Q;

second sensing means for generating a pulse signal having a time width proportional to the reciprocal 1/N of said engine rpm N;

a second multiplier circuit connected to said second sensing means, said oscillator circuit and said first multiplier circuit, for repeatedly adding said binary coded output from said first multiplier circuit in response to said clock pulses, the number of times of the addition in said second multiplier circuit being controlled by the pulse signal from said second sensing means, and for generating a binary coded output signal proportional to a product

$$Q \cdot \frac{1}{N};$$

third sensing means connected to a crankshaft of said engine for generating a pulse signal at specific angular positions of said crankshaft; and

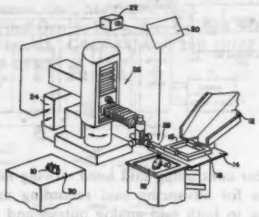
a conversion circuit connected to said second and said third sensing means, for generating, in synchronism with said pulse signals from said third sensing means, a pulse signal having a time width proportional to said binary coded output signal of said second multiplier circuit and indicative of fuel injection amount.

3,986,007

METHOD AND APPARATUS FOR CALIBRATING MECHANICAL-VISUAL PART MANIPULATING SYSTEM

Carl F. Ruoff, Jr., Dayton, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 28, 1975, Ser. No. 636,069
Int. Cl.² H04M 7/18
U.S. Cl. 235—151.1 7 Claims



1. In a workpiece manipulating system having a manipulator with jaw means for engaging a workpiece on a work area, said manipulator having sensor means for indicating the coordinate position of said jaw means in a first coordinate system, and an optical image converter positioned to view an image on the work area and generate a signal in reponse thereto, analyzing means operatively coupled with said converter for computing the coordinate position of the centroid of said image in a second coordinate system, a method for translating coordinate positions from said second coordinate system to coordinate positions in said first coordinate system comprising the steps of:

placing a target in said jaw means,

moving said jaw means and target between a predetermined number of points across said work area,

determining the coordinate position of said target in both of said coordinate systems at each of said points,

computing transformation factors for translating any coordinate position on said work area in said second coordinate system to the same coordinate position on said work area in said first coordinate system, and

storing said transformation factors.

3,986,008

DATA COMPOSITING AND ARRAY CONTROL SYSTEM

J. Robert Fort; James A. Westphal, both of Altadena, and Donald R. Juilfs, Chatsworth, all of Calif., assignors to Geophysical Systems Corporation, Pasadena, Calif.

Continuation of Ser. No. 358,078, May 7, 1973, Pat. No. 3,883,725. This application Apr. 7, 1975, Ser. No. 566,045
The portion of the term of this patent subsequent to May 13, 1992, has been disclaimed.
Int. Cl.² G01V 1/28
U.S. Cl. 235—151.3 16 Claims

1. In a data recording system having a repetitive source, in which on each repetition of said source one or more analog signals are detected, amplified and converted to digital signals which are stored, and said stored pulses are read out at selected command intervals to form trains of single bit signals, and said trains are transmitted to a data recording means, the method of recording and compositing said trains of single bit signals comprising the steps of:

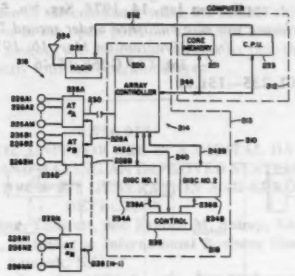
a. running a rotating magnetic digital recording means at substantially constant speed, said recording means having a plurality of tracks each with a separate transducing head;

b. responsive to a first command producing said first train of single bit signals representative of a first source;

c. recording in sequence, along said tracks, in a first plurality of single bit, spaced, locations, each of the bits in said first train;

d. repeating said source for a second time and responsive to a first command producing and transmitting to said recording means a second train of single bit signals representative of a second source;

e. reading out from said recording means said first train of bits stored in said first single bit locations;



f. storing said second train of single bit signals in said first plurality of spaced single bit locations; and

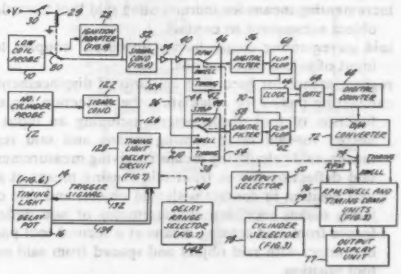
g. storing said first train of bits in a second plurality of spaced multiple bit word locations.

3,986,009

POWER CONTRIBUTION MEASUREMENT SYSTEM FOR INTERNAL COMBUSTION ENGINES

Anthony J. Fastaia, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 26, 1975, Ser. No. 562,090
Int. Cl.² G01M 15/00; G01V 1/28
U.S. Cl. 235—151.3 7 Claims



1. A system for measuring the relative power contribution and relative compression for each cylinder in an internal combustion engine having a spark ignition device connected to each cylinder comprising

means for generating a series of voltage pulses wherein each pulse has a duration equivalent to the duration of the ignition voltage for one of said spark ignition devices,

digital counter means,

means for producing in said digital counter means in response to said series of voltage pulses a first signal indicative of the time between initiation of the voltage pulse for each respective cylinder and the initiation of the voltage pulse for the next cylinder, and a second signal indicative of the time duration of the said voltage pulse for each cylinder,

and means responsive to said first and second signals in said digital counter means for producing first and second output signals for each cylinder indicative respectively of the relative power contribution and relative compression of said cylinder.

3,986,010
AUTOMATIC TOOL DEFLECTION CALIBRATION SYSTEM

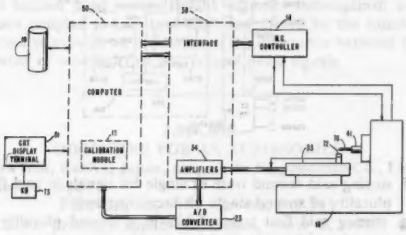
Larry Gene Lankford, Mahopac, and William Robert Whittle, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 390,990, Aug. 23, 1973. This application Jan. 14, 1975, Ser. No. 540,767

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.[2] G06F *15/46*

U.S. Cl. 235—151.11 **28 Claims**



1. In a computer controlled numerical-control system,

an object,

a numerically-controlled machine tool indluding force sensing means for sensing deflection forces,

control means for controlling said numerically-controlled machine tool,

data means for generating data directing said tool towards contact with said object having an output coupled to the input of said control means,

incrementing means for incrementing said tool towards said object subsequent to contact,

said incrementing means having an output coupled to the input of said control means,

register means for recording amounts of displacement,

calculating means for calculating the deflection force as a function of tool displacement including an input connected to said force sensing means and said register means, said calculating means receiving measurements of said deflection forces from said sensing means at a first tool position in contact with said object, and said calculating means receiving measurements of said deflection forces from said sensing means at a second tool position in contact with said object and spaced from said second tool position.

3,986,011
PRINTER-PLOTTER SYSTEM

John S. Poole; H. Blair Muhlestein, both of Wilmington, Del.; Douglas H. Smith, Avondale, Pa., and Lennart Bilen, Wilmington, Del., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 24, 1975, Ser. No. 552,094

Int. Cl.[2] G06F *3/12*; **G06K** *15/02*

U.S. Cl. 235—151.22 **5 Claims**

1. A system for presenting both analog and alphanumeric information on a recording medium, said system comprising:

transducer means for providing a time varying signal;

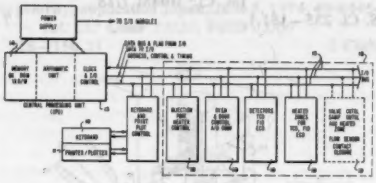
processing means responsive to said transducer means for operating on said signal to produce an analog output and an alphanumeric output;

printer-plotter means responsive to said processing means for plotting said analog output and for interrupting said plotting to print said alphanumeric output on a real-time basis, said printer-plotter including: a platen;

means for selectively advancing a recording medium on said platen;

a print-plot head having a plurality of selectively energizable recording segments;

means for moving said print-plot head across said platen;



means for controlling said head moving means and said means for advancing said recording medium in response to both said analog output and said alphanumeric output; and

means for energizing selected ones of said recording segments in a first mode to produce a continuous trace of said analog output, and in a second mode to product dot patterns representing said alphanumeric output.

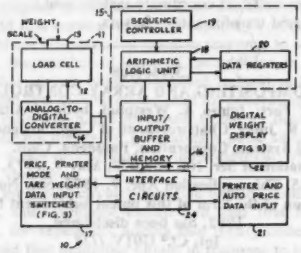
3,986,012
DIGITAL WEIGHT MEASURING AND COMPUTING APPARATUS WITH AUTOMATIC ZERO CORRECTION

Richard C. Loshbough, Temperance, Mich.; Roger B. Williams, Jr., Sylvania, and Edward G. Pryor, Westerville, both of Ohio, assignors to Reliance Electric Company, Pepper Pike, Ohio

Continuation-in-part of Ser. No. 466,303, May 2, 1974, abandoned, which is a continuation of Ser. No. 434,400, Jan. 18, 1974, abandoned. This application Apr. 30, 1975, Ser. No. 573,149

Int. Cl.[2] G06F *15/06, 15/20*; **G01G** *19/413*

U.S. Cl. 235—151.33 **12 Claims**



1. Improved weight measuring apparatus having a weight output composed of a predetermined number of significant weight digits and including means for automatically correcting errors in the weight output for zero weight comprising, in combination, scale means for generating a digital weight signal having at least one more least significant digit than the weight output, memory means for storing a zero correction factor, means for periodically generating a corrected weight from the algebraic sum of the generated weight signal and the zero correction factor stored in said memory means, the most significant predetermined number of digits of the corrected weight comprising the weight output, and means responsive to the corrected weight falling within a predetermined small weight range for periodically modifying the zero correction factor stored in said memory means by a predetermined amount less than the least significant weight output digit to

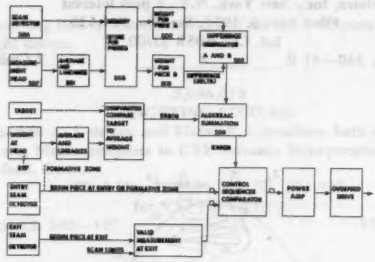
decrease the absolute value of the corrected zero weight toward zero.

3,986,013

METHOD AND APPARATUS FOR CONTROLLING YIELD OF DISCRETE PIECES AND CHARACTERISTICS THEREOF

Norman R. Brunette, Clover, S.C., assignor to Automated Energy Systems, Inc., Matthews, N.C.

Filed Oct. 3, 1974, Ser. No. 511,528
Int. Cl.² G06F *15/46;* **F26B** *13/12*
U.S. Cl. 235—151.33 **13 Claims**



8. Apparatus for controlling fabric weight per unit length of a multi-piece strip of fabric moving through a tenter comprising in combination;

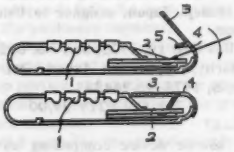
a. means for moving the strip of fabric through the tenter;
b. overfeed-underfeed rolls disposed at the entrance end of the tenter and driven by said means for moving;
c. means for sensing the weight per unit length of the finished fabric pieces exiting the tenter;
d. means for storing a predetermined absolute target weight per unit length for the fabric pieces;
e. means for averaging and linearizing the sensed weight;
f. means for comparing the averaged and linearized sensed weight to the target weight for determining any difference;
g. means for detecting the beginning of each piece prior to entry into the overfeed-underfeed rolls; and
h. means for using any difference to control the speed of said moving fabric strip at least where the beginning of each piece is detected.

3,986,014

HOOD STRUCTURE FOR ELECTRONIC CALCULATORS

Saburo Katsui, Nara, and Shinji Tsugei, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed July 17, 1973, Ser. No. 380,111
Claims priority, application Japan, July 17, 1972, 47-84182[U]; Apr. 11, 1973, 48-43244[U]
Int. Cl.² G06F *15/30;* **G02F** *1/28*
U.S. Cl. 235—152 **8 Claims**



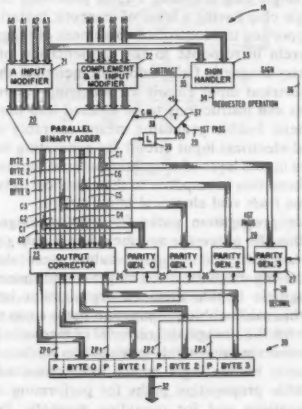
1. A housing for an electronic calculator comprising a calculator body having an upper surface provided with a keyboard section and an indication section of the liquid-crystal type, a tiltable, shielding hood structure slidably mounted on the end portion of the upper surface of said calculator body adjacent said indication section, said shielding hood structure being tiltable from an open position to a closed position above only said indication section, and a window portion disposed adjacent said indication section for introducing ambient light beams through the tiltable shielding hood structure into the indication section of the calculator when the tiltable shielding hood structure is in the open position, said light beams being scattered after striking the indication section so that they do not reflect directly into the operator's eyes.

3,986,015

ARITHMETIC UNIT FOR USE IN A DIGITAL DATA PROCESSOR AND HAVING AN IMPROVED SYSTEM FOR PARITY CHECK BIT GENERATION AND ERROR DETECTION

David N. Gooding, Endicott, and Everett M. Shimp, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 23, 1975, Ser. No. 589,298
Int. Cl.² G06F *11/10;* **H04L** *1/10;* **H03K** *13/34*
U.S. Cl. 235—153 BB **11 Claims**



1. An arithmetic unit for a digital data processor comprising:

binary arithmetic circuitry for arithmetically combining two binary data bit sequences;

modifier circuitry for receiving the resultant data bit sequence produced by the arithmetic circuitry and modifying the bits therein, where necessary, to obtain a desired result;

parity check bit generating circuitry having data bit inputs coupled only to the data bit outputs of the arithmetic circuitry and responsive to the entire resultant unmodified data bit sequence produced by the arithmetic circuitry for generating at least one parity check bit;

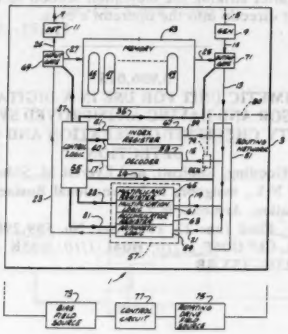
and assembler circuitry for concatenating the modified data bit sequence produced by the modifier circuitry with the parity check bit produced by the parity check bit generating circuitry.

3,986,016

SINGLE CHIP MAGNETIC BUBBLE PROCESSOR

John Charles Linn, and Rex Alan Naden, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 10, 1975, Ser. No. 548,652
Int. Cl.[2] G06F *1/00, 7/38*
U.S. Cl. 235—156 9 Claims



1. A single chip magnetic bubble processor comprising:

a single chip having a layer of magnetic material capable of supporting the controlled movement of magnetic bubbles therein in response to the reorientation of an in-plane rotary magnetic field, said chip including thereon:

an electrical input circuit for receiving external electrical data and instructions to be entered into the processor;

magnetic bubble generator means operably connected to said electrical input circuit for generating magnetic bubbles in said layer of magnetic material representing bits of information in response to the electrical data and instructions from said electrical input circuit;

bubble propagation paths for routing magnetic bubbles within the processor and including a path operably associated with said magnetic bubble generator means for receiving magnetic bubbles generated thereby;

a magnetic bubble memory organization interconnected within said bubble propagation paths so as to be accessible for the storage and retrieval of magnetic bubble information via said bubble propagation paths;

magnetic bubble logic means interconnected within said bubble propagation paths for performing mathematical operations and for providing magnetic bubble output information representing the results thereof;

magnetic bubble decoder means operably connected to said magnetic bubble generator means via said bubble propagation paths for decoding magnetic bubble information and providing magnetic bubble output signals for determining the operations to be performed by the processor;

magnetic bubble control logic means operably connected to said magnetic bubble memory organization, said magnetic bubble logic means and said magnetic bubble decoder means via said bubble propagation paths and responsive to the magnetic bubble output signals from said magnetic bubble decoder means for controlling the routing of magnetic bubble information along said bubble propagation paths, the storage of magnetic bubble information in said magnetic bubble memory organization and retrieval therefrom, and for instructing said magnetic bubble logic means as to which mathematical operations are to be performed thereby;

magnetic bubble detection means operably connected to said magnetic bubble logic means via said bubble propagation paths for receiving the magnetic bubble output information therefrom and converting said magnetic bubble output information into discrete processor electrical output signals; and

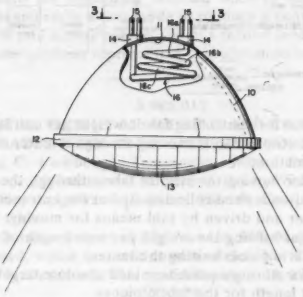
an electrical output circuit operably connected to said magnetic bubble detection means for transmission of the discrete processor electrical output signals from the processor, whereby complex programs involving mathematical and logical operations using magnetic bubble data and instructions may be performed on said single chip.

3,986,017

AUTOMOBILE HEADLIGHT

Frank Kulle, Sun City, Ariz., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Apr. 3, 1975, Ser. No. 564,620
Int. Cl.[2] H05B *33/00*
U.S. Cl. 240—41 R 2 Claims



1. A substantially glare-free vehicle headlight comprising: a reflector housing, a light emitting element constructed and arranged to be mounted in said housing adjacent the rear wall thereof said light emitting element comprising a gas-filled arc discharge tube arranged in the form of a plurality of spaced apart coils, of progressively increasing diameter and having the configuration of a truncated helix, the longitudinal axis of which is substantially perpendicular to the plane of the lens, the major coil of said truncated helix being foremost in said housing, a lens arranged to be secured at the forward end of said housing, a pair of laterally spaced terminal blocks arranged to project from the rear wall of said housing, each one of the two ends of said light emitting element arranged to engage in one of said terminal blocks, and each terminal block having a pair of terminal posts for connecting said light emitting element to a source of electric energy.

3,986,018

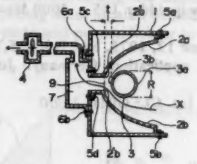
LIGHT SOURCE DEVICE

Takao Ishii, Himeji, Japan, assignor to Ushio Electric Inc., Tokyo, Japan

Filed Oct. 15, 1975, Ser. No. 622,670
Claims priority, application Japan, Oct. 15, 1974, 49-123537; Mar. 6, 1975, 50-26481
Int. Cl.[2] F21V *29/00*
U.S. Cl. 240—47 4 Claims

1. A light source device comprising an elongated box-shaped housing, a cooling means provided on the back wall of said house, a gutter-shaped reflex mirror having a slit at its bottom and a tubular elongated light source arranged within and along the longitudinal direction of said housing, wherein said light source has an electrical input power more than 90

watt per 1 cm of arc and the distance between a slit and a bulb wall portion *3b* of said light source on the downstream side of

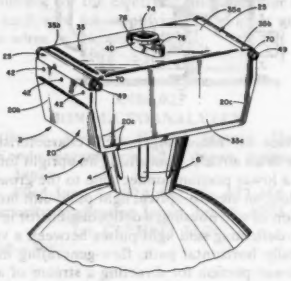


a cooling flow is within one-third of the outer diameter of said light source.

3,986,019
LIGHTING FIXTURE

Hendrik A. J. deVos, and Elzear R. Labouliere, both of Swansea, Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 1, 1975, Ser. No. 573,435
Int. Cl.² F21V *17/00*
U.S. Cl. 240—147 **11 Claims**



1. A lighting fixture, comprising:

power supply components for the lighting fixture;

an enclosure member defining a space for containing the power supply components for the lighting fixture, said enclosure member having a bottom portion and first and second end portions extending upwardly from the opposite ends of the bottom portion thereby to provide an open top and open sides for the enclosure member;

first and second connection means secured, respectively, to the first and second end portions of the enclosure member adjacent to the extremities of the first and second end portions;

a support tray extending across the open top of the enclosure member between the first and second connection means;

mounting means mounting at least one of the power supply components to the support tray so that said at least one component suspends from the support tray into the space defined by the enclosure member;

a cover member having a top portion overlying the support tray and first and second opposed side portions extending from the top portion and enclosing the open sides of the enclosure member thereby enclosing the space defined by the enclosure member;

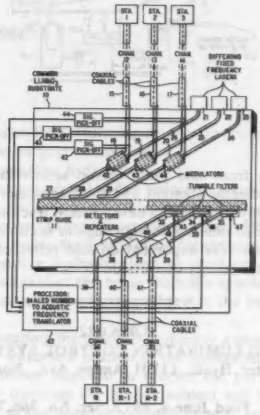
first and second securing means releasably securing the cover member to the first and second connection means, respectively, said first securing means further pivotally securing the cover member to the first connection means, whereby when the cover member is released from the second connection means the rest of the fixture, including the enclosure member, the second connection means, the mounting means, and the support tray and the at least one power supply component mounted thereto, is able to pivot with respect to the first connection means; and

attachment means secured to the top portion of the cover member for mounting the lighting fixture to a support structure.

3,986,020
COMMON MEDIUM OPTICAL MULTICHANNEL EXCHANGE AND SWITCHING SYSTEM

Herwig Werner Kogelnik, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 25, 1975, Ser. No. 616,560
Int. Cl.² H04B *9/00*; **H04M** *3/56*
U.S. Cl. 250—199 **12 Claims**



1. A common medium multichannel exchange system of the type including a common medium, a plurality of customers or facilities, and means for coupling signals from and to said plurality of customers or facilities onto and off of the common medium, characterized in that the common medium is an optical common waveguide medium and in that the coupling means comprise optical directional filters of differing pass bands at least some of which are tunable over the entire exchange system bandwidth.

3,986,021
PASSIVE SOLAR TRACKING SYSTEM FOR STEERABLE FRESNEL ELEMENTS

Robert D. Hitchcock, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 24, 1975, Ser. No. 625,394
Int. Cl.² G01J *1/20*
U.S. Cl. 250—203 R **10 Claims**

1. An angular tracking servo system for passive tracking of the sun, utilizing solar radiation for controlling the attitude of a mirror element in an array of Fresnel reflectors, comprising:

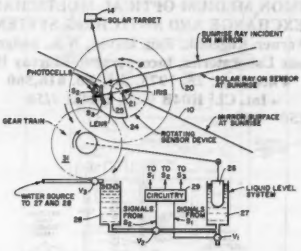
a. a reflector element mounted on an axis for rotational movement to reflect solar rays impingent upon the reflector surface to a solar energy conversion device;

b. a rotating sensor device mounted on said reflector element axis for rotation therewith; said sensor device including photovoltaic sensor means for generating current outputs in response to solar radiation impingent thereon;

c. a liquid level means containing a float means which operates to move vertically as the level of liquid in the liquid-level means changes;

d. drive means connected between said rotatable reflector axis and said float means operable to rotate said reflector in response to vertical movement of said float means;

e. means for raising and lowering the level of the liquid in said liquid-level means in response to current output



signals from said photovoltaic sensor means, whereby said reflector element and rotating sensor device is continuously rotated to a new position tracking the sun from sunrise to sunset with high angular accuracy and focusing the solar rays impingent on said reflector element onto the solar energy conversion device.

3,986,022

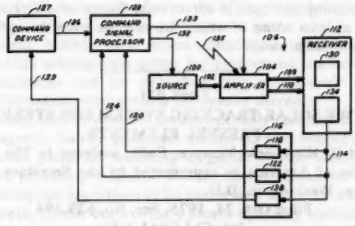
ILLUMINATION CONTROL SYSTEM

Gilbert Peter Hyatt, 11101 Amigo Ave., Northridge, Calif. 91324

Filed June 4, 1973, Ser. No. 366,714

Int. Cl.² G01J *1/32*

U.S. Cl. 250—205 **49 Claims**



14. An illumination control system comprising:

controlling means for controlling illumination in response to at least one control signal;

feedback means for generating a feedback signal in response to the controlled illumination;

command means for generating a command signal related to desired illumination and

comparing means for comparing the command signal with the feedback signal, said comparing means including means for generating the control signal in response to the comparison.

3,986,023

DEVICE FOR MEASURING OPTICAL CHARACTERISTICS OF THE ATMOSPHERE OF AN AIRFIELD

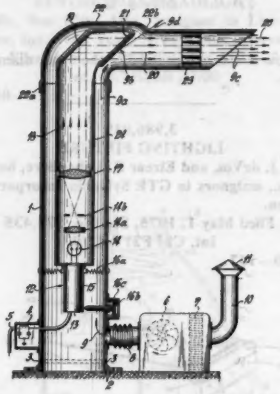
Frank Früngel, Herwigredder 105 a, 2000 Hamburg 56, Germany

Filed June 12, 1975, Ser. No. 585,797

Claims priority, application Germany, June 14, 1974, 2428901

Int. Cl.² G01D *21/00*

U.S. Cl. 250—239 **17 Claims**



1. A device for measuring optical characteristics of the atmosphere of an airfield, comprising an upright tubular housing having a lower portion connectable to the ground, and an upper portion; an electro-optical light pulse unit means in said lower portion of said housing; a deflecting mirror in said upper portion for deflecting said light pulses between a vertical and a substantially horizontal path; flow-generating means adjacent said lower portion for directing a stream of air through said tubular housing; and means for shielding said electro-optical means from said air stream, comprising a shielding tube mounted within said tubular housing and surrounding said electro-optical means so as to prevent access of contaminants contained in said air stream.

3,986,024

ARRANGEMENT FOR ELECTRICAL DETECTION OF IONS FOR MASS-SPECTROSCOPIC DETERMINATION OF THE MASS-MAGNITUDES AND MASS-INTENSITIES OF IONS

Leonhard Radermacher, Julich-Selgersdorf, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Dec. 15, 1975, Ser. No. 640,950

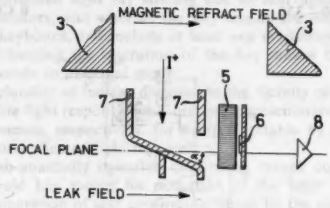
Claims priority, application Germany, Dec. 23, 1974, 2461224

Int. Cl.² B01D *59/44*

U.S. Cl. 250—299 **7 Claims**

1. An arrangement for electrical detection of ions for mass spectroscopic determination of the mass values and of the mass intensities of ions, comprising in combination, a channel multiplier plate having a number of electron multipliers of minimum dimension; mass spectroscopic means with magnet means and exit gap means, said channel multiplier plate being located behind said exit gap means of said magnet means for receiving ions focused in the focal plane of said mass spectroscopic means; means for receiving electrons emanating from said channel multiplier plate and emitted off by ions of different mass in said electron multipliers of said channel multiplier plate; recording means connected to said means for receiving

electrons emanating from said channel multiplier plate, said receiving means transmitting signals generated by the received electrons to said recording means; said means for receiving the electrons and transmitting the signals generated by the electrons comprising wires located behind and along the channel multiplier plate and perpendicular to the direction of the



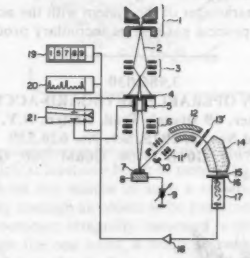
electron multipliers and perpendicular to the lengthwise direction of said exit gap means, said wires being isolated from each other and free from contact with each other, said wires having surfaces facing the channel multiplier plate and comprising receiving surface for the electrons; and amplifier means connected to each wire for amplifying the current pulses generated in the wires by the electrons.

3,986,025

ION MICROANALYZER

Mitsuo Fujiwara, Katsuta; Hifumi Tamura, Hachioji, and Toshio Kondo, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 7, 1974, Ser. No. 477,466
Claims priority, application Japan, June 8, 1973, 48-63803
Int. Cl.² H01J *37/26*
U.S. Cl. 250—306 **18 Claims**



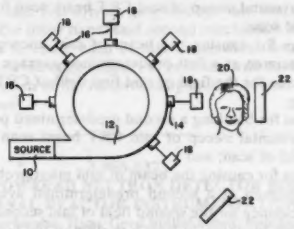
1. An ion microanalyzer comprising means for emitting primary ions, means for bombarding a sample with the primary ions to thereby emit secondary ions from said sample, first means for dispersing the secondary ions in accordance with their mass to electric charge ratios, means for detecting the secondary ions dispersed by said first dispersing means, and means for focusing the secondary ions in a direction perpendicular to that of the dispersion of the secondary ions more than in other directions into a predetermined position between said sample and said detecting means to thereby form an image of the secondary ions emitted from said sample on the predetermined position.

3,986,026

APPARATUS FOR PROTON RADIOGRAPHY

Ronald L. Martin, La Grange, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 14, 1975, Ser. No. 632,030
Int. Cl.² G01N *23/02*
U.S. Cl. 250—306 **10 Claims**



1. An apparatus for performing diagnostic proton radiography of a human subject comprising:

a source of negative hydrogen ions;

a synchrotron connected to the source to receive the negative hydrogen ions and accelerate them in an orbit to a precisely controlled predetermined value of energy;

means connected to the synchrotron for stripping the accelerated negative hydrogen ions to produce a beam of protons and extract the beam from the synchrotron;

means for disposing the human subject in the beam of protons;

means for sweeping the beam of protons in a predetermined pattern to traverse a portion of the human subject;

a proton detector disposed to receive the portion of the beam that traverses the human subject and to detect a parameter of the protons received thereat; and

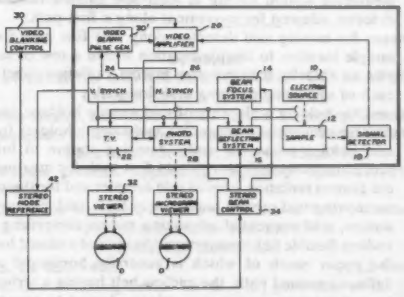
display means connected to the sweeping means and the detecting means to produce from information about beam position and beam intensity a proton radiograph of the subject.

3,986,027

STEREO SCANNING MICROPROBE

Duane C. Holmes, Milpitas, Calif., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 7, 1975, Ser. No. 565,970
Int. Cl.² G01N *23/00*; G21K *7/00*; H04N *9/54*, *9/60*
U.S. Cl. 250—310 **7 Claims**



1. In a scanning charged particle microprobe system including a source of charged particles, means for collimating said

particles into a beam, means for scanning said beam in a predetermined raster pattern over a specimen in said microprobe system, detector means including means for generating a signal proportional to charged particles detected, CRT image recording means connected to said detector means to record detection of charged particles exiting said specimen, the improvement comprising:

means synchronizing scan of beam of microprobe to the beam of said CRT;

means for blanking a first predetermined portion of such horizontal sweep of said CRT beam scan for one field of said scan;

means for causing the beam of said microprobe to scan specimen at a first predetermined average angle of incidence for the field of said first field of CRT beam blanking;

means for blanking a second predetermined portion of each horizontal sweep of said CRT beam scan for a second field of scan; and

means for causing the beam of said microprobe to scan said specimen at a second predetermined average angle of incidence for the second field of said second field of CRT beam blanking, at least a portion of the horizontal sweep of said second field blanking being mutually distinct from a part of the horizontal sweep of said first field blanking.

whereby side-by-side images responsive to the sweep of said microprobe are produced on said CRT.

3,986,028

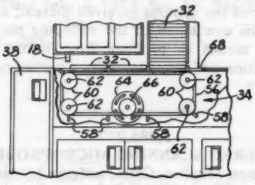
AUTOMATIC GAMMA RADIATION SCANNING DEVICE AND FEED MECHANISM FOR PLURAL SAMPLE HOLDERS

William J. Byrd, Solana Beach, Calif., assignor to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Jan. 20, 1975, Ser. No. 542,118

Int. Cl.² G01T 1/100

U.S. Cl. 250—328 **25 Claims**



1. Apparatus for measuring the gamma radiation label in each of a plurality of samples located in a number of rows on a sheet member carried by a sample holder, comprising:

a measuring station having at least one gamma radiation detector adapted for movement along a first path;

means for moving said detector along said first path from sample location to sample location within a row of samples to thereby measure the gamma radiation label of each of said samples along said first path;

means for holding a plurality of said sample holders; and,

means for sequentially advancing said sample holders from said holding means to said measuring station to bring successive rows in line with said first path for measuring the gamma radiation label of said samples and for thereafter moving said sample holder away from said measuring station, said sequential advancing means comprising an endless flexible link means movable around a closed loop, the upper reach of which is generally horizontal and defines a second path, the endless belt having a series of spaced apart transverse projections adapted to engage a single sample holder and move the same toward said measuring station as said belt moves around said loop and means for driving said endless belt around said loop.

3,986,029

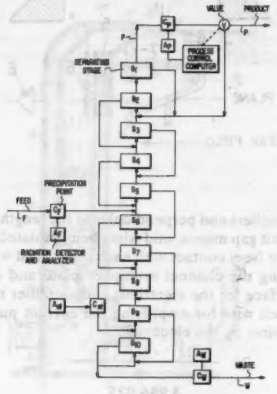
METHOD FOR CONTROLLING URANIUM ENRICHMENT SYSTEMS

Peter Hans Koske, Kiel-Schilksee, and Gerhard Langbein, Oberuldingen, both of Germany, assignors to URANIT Uran-Isotopentrennungs-GmbH, Julich, Germany

Continuation-in-part of Ser. No. 360,006, May 14, 1973, abandoned. This application May 23, 1975, Ser. No. 580,520

Int. Cl.² G01T 1/16

U.S. Cl. 250—336 **6 Claims**



1. In a method of controlling the operation enrichment systems in which gaseous uranium compounds are processed, the improvement comprises:

separating, at least one precipitation point in the system, a small quantity of the process gas compound and its secondary products;

measuring the radioactive radiation of the separated process gas compound and its secondary products;

identifying the age of the process gas compound passing through the precipitation point with the radioactive radiation measurements; and

controlling a parameter of the system with the accumulated data of the process gas and its secondary products.

3,986,030

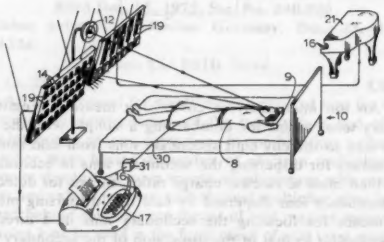
EYE-MOTION OPERABLE KEYBOARD-ACCESSORY

Erwin S. Teltscher, 69 Diana's Trail, Roslyn, N.Y. 11576

Filed Nov. 3, 1975, Ser. No. 628,539

Int. Cl.² B41J 5/08; G01D 21/04; G06M 7/00; G08C 1/00

U.S. Cl. 250—349 **8 Claims**



1. An eye-motion operable keyboard-accessory comprising:

invisible light-source means disposed in the vicinity and independent of the position of an operator for directing

a light ray at an eye of the operator and obtaining a light reflection therefrom;

a plurality of invisible-light responsive sensors arranged in a keyboard pattern, each of said sensors having an output and being selectively actuable by the operator-reflected light ray, the outputs of said sensors being connectible to a plurality of electrically actuable key means, respectively, for actuation of the key means upon said operator-reflected light ray striking one of said light-responsive sensors, and wherein the key means are disposed on a keyboard, and include at least one mode-key means for changing the operation of the key means from a first mode to a second mode;

a plurality of indices disposed in the vicinity of said invisible-light responsive sensors and representative of said key means, respectively, for being targetable by said operator-reflected light-ray; and

limb-unaidedly operable confirming means connected to said key means for actuation of the latter only upon operation of said confirming means by the operator.

3,986,031

SCANNING DEVICE FOR AXIAL TRANSVERSE TOMOGRAPHY

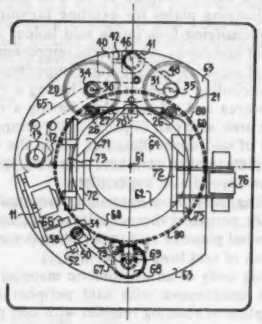
Rene Chekroun, Paris, France, assignor to Compagnie Generale de Radiologie, Paris, France

Filed Sept. 26, 1975, Ser. No. 617,080

Claims priority, application France, Oct. 14, 1974, 74.34490

Int. Cl.² G01N *23/00, 23/02, 23/04*

U.S. Cl. 250—360 **11 Claims**



1. A scanning device for axial transverse tomography of the kind in which at least one beam of penetrating radiation emitted by at least one source of such a radiation and received, after passing through an object to be examined, by at least one radiation detector integrally mounted with said source, is imparted, on the one hand, a rectilinear reciprocating scanning motion in order to displace the beam perpendicular to itself in a plane and over a given distance and, on the other hand, at the time of reversal of the direction of the rectilinear scanning motion, an intermittent rotary motion about an axis perpendicular to the plane scanned by the beam, in order to make said beam pivot through a predetermined angle about said axis, said scanning device comprising a fixed support secured to the ground; a first movable support mounted on said fixed support for rotation about said axis; a first motor means mounted on said first movable support and having a shaft providing a continuous rotary motion; a fixed geared structure secured to said fixed support for engaging with a first driving gear journalled to said first movabe support; a first mechanism called an indexing mechanism, having an input shaft coupled to the shaft of said first motor means for transforming said continuous rotary motion into an intermittent rotary motion of an output shaft coupled to said first driving gear; a second movable support mounted slideably on said first movable support for rectilinear translatory motion thereon and carrying said sources and said detectors; and a second mechanism couped to said shaft of said first motor means for transforming said continuous rotary motion into a reciprocating rectilinear motion of adjustable amplitude of said second movable support relatively to said first movable support, the transmission ratios and the settings of the coupling elements between said first motor means' shaft and, on the one hand, said first driving gear through said first mechanism and, on the other hand, said second mechanism being so determined as to cause each of said intermittent rotary motions of said first movable support to coincide with each reversal of the direction of the reciprocating motion of said second movable support.

3,986,032

SELF-POWERED NEUTRON DETECTOR FOR EXTERNAL REACTOR INSTRUMENTATION

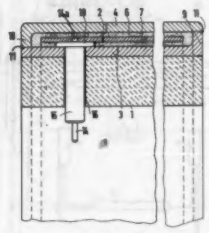
Erich Klar, Karlsruhe; Hans-Gerd Spillekothen, Bensberg, and Pierre Haller, Erlangen, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Dec. 3, 1974, Ser. No. 529,030

Claims priority, application Germany, Dec. 3, 1973, 2360221

Int. Cl.² G01T *3/00*

U.S. Cl. 250—390 **8 Claims**



1. A self-powered neutron detector comprising a tubular collector, a tubular emitter surrounding said collector, a tubular collector surrounding said emitter, and electrical insulation between said emitter and said collectors, said collectors being electrically interconnected.

3,986,033

SWITCHING DEVICE FOR AN X-RAY GENERATOR COMPRISING A TIME SWITCH

Heinz Mester, and Gerd Vogler, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 15, 1974, Ser. No. 451,534

Claims priority, application Germany, Mar. 22, 1973, 2314267

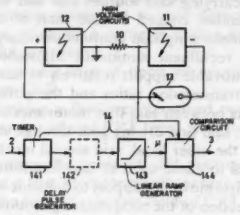
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² H05G *1/30*

U.S. Cl. 250—402 **12 Claims**

1. In a switching device for an x-ray generator of the type including a high voltage transformer for supplying current to the x-ray tube and a switching element connected in the transformer primary circuit, the improvement comprising a time switch for controlling the actuation time of the switching

element wherein the actuation time of the switching element is longer than the exposure time, and means coupled to the



time switch for prolonging the switching element actuation time as a function of the x-ray tube current.

3,986,034
X-RAY EXAMINATION APPARATUS

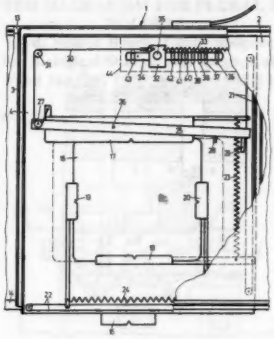
Fritz Wittkopp, Weiher, and Gerhard Wenzek, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Mar. 19, 1975, Ser. No. 559,873

Claims priority, application Germany, Mar. 29, 1974, 2415410

Int. Cl.² G03B *41/16*

U.S. Cl. 250—468 **1 Claim**



1. In an X-ray examination apparatus including an examination table with a patients' support platform; an X-ray source having remote-controllable focusing means for the X-radiation; a cassette drawer adapted to be inserted below said patients' support platform of said examination table; clamping means for clamping an X-ray film cassette within said cassette drawer; and means for converting the cassette dimensions determined by said clamping means into electrical values for the control of said focusing means, the improvement comprising: said clamping means including at least one clamping jaw; a transmitter being located in said cassette drawer slidably supported in a direction transverse to the insert direction of said cassette drawer into said examination table, said clamping jaw being coupled to said transmitter; switch means in said examination table adapted to be actuated by said transmitter upon insertion of the cassette drawer into said examination table, said switch means being associated with distinct positions of said transmitter pursuant to the different cassette dimensions of the cassettes which are insertable into said cassette drawer; a spring-loaded traction cord for coupling said clamping jaw to said transmitter; a lever articulated to said clamping jaw being interposed for connecting said clamping jaw with said transmitter for having said clamping jaw contact the cassette width and the cassette length; and projections on said lever for sensing the dimensions of the cassettes insertable into said cassette drawer in the longitudinal direction of said clamping jaw; said transmitter comprising a permanent magnet, and said switch means comprising magnetically actuatable contacts; said contacts being reed contacts; frame means for holding said cassette drawer; means for converting the dimensions sensed into movement transverse to the insertion direction of the cassette drawer into said frame means, the correct responsive switch contact being actuated even with incomplete insertion of the cassette drawer into said frame means.

3,986,035
VACUUM FILM HOLDER FOR X-RAY FILMS AND INTENSIFYING FOILS

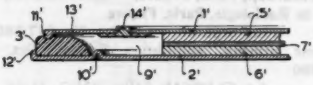
Andreas Schmitzer, Rebenweg 41, Kelheim (Danube), Germany

Continuation of Ser. No. 343,982, March 22, 1973, abandoned. This application Dec. 24, 1974, Ser. No. 536,150

Claims priority, application Germany, Mar. 25, 1972, 2214613

Int. Cl.² G03D *13/08*

U.S. Cl. 250—480 **4 Claims**



1. In a vacuum film holder for X-ray films and intensifying foils having a cavity adapted to be evacuated, said holder including clamping plates for exerting pressure upon X-ray films and intensifying foils inside said holder in response to evacuation of said cavity, wherein the improvement comprises

a. a pair of separate and separable superimposed clamping plates including an upper plate having a relatively small surface area and a lower plate having a relatively large surface area, said pair of plates being arranged so that the outline of said upper plate lies within the outline of said lower plate and a peripheral area of said lower plate projects beyond said upper plate;

b. a sealing projection extending from said upper plate along the periphery thereof substantially at right angles to the general plane of said upper plate toward said peripheral area of said lower plate; and

c. a sealing body of an elastomeric material having a base surface coextensive with said peripheral area of said lower plate in abutting relation with said peripheral area of said lower plate and affixed to said lower plate, said sealing body having a considerably larger width measured in a direction parallel to the plane defined by said lower plate than the width thereof measured at right angles to said direction, and said sealing body having a surface remote from said lower plate arranged in such a way that said sealing projection penetrates into said sealing body when atmospheric pressure exceeds the pressure inside the space bounded by said pair of clamping plates and said sealing body.

3,986,036
SELECTIVE SHIELDING DEVICE FOR SCINTIPHOTOGRAPHY

John W. Harper, 3623 Bob Billa, San Antonio, Tex. 78223, and Thomas D. Kay, 2814 Knight Robin, San Antonio, Tex. 78209

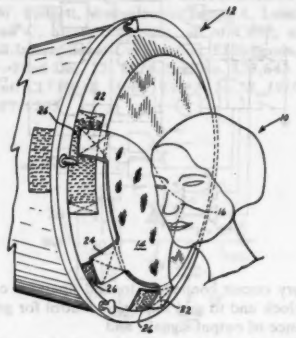
Filed May 19, 1975, Ser. No. 578,848

Int. Cl.² G21F *1/00, 3/00*

U.S. Cl. 250—515 **1 Claim**

1. The combination of a selective shielding device and a scintillation camera comprising three fastening elements secured in preselected locations on said camera, said shielding

device being formed of a substantially oval shaped body having a predetermined length and a width substantially one half the size of said predetermined length, said body having a convex-shaped tip extending in the direction of said width of said body on the periphery of one side of said body, a pair of fastening elements secured to opposite sides of said body lying substantially along the length thereof, a third fastening element secured to said body lying substantially along the width thereof on a side of said body opposite said convex-shaped tip,



said fastening elements on said camera and said fastening elements on said shielding device being capable of rapidly and adjustably mounting said shielding device to said camera at preselected locations thereon and said body of said shielding device being made of a vinyl coated lead material capable of blocking any radiation emitted by said camera, whereby the head of a patient located adjacent said camera and having a preselected area of said head positioned in front of said shielding device is prevented from receiving any radiation upon said preselected area.

3,986,037

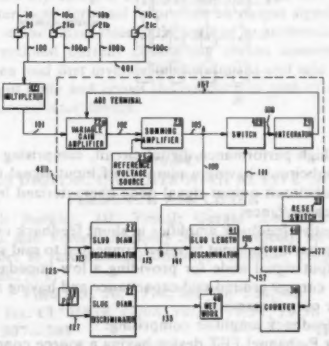
YARN DETECTOR WITH A SELF-CALIBRATING CIRCUIT

Mark Edwin Faulhaber, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 3, 1975, Ser. No. 619,197

Int. Cl.² G01N *21/32*

U.S. Cl. 250—562 **2 Claims**



1. In a yarn inspection system for detecting variations in yarn diameter wherein a yarn moves past a transducer for generating electrical signal outputs corresponding to yarn diameter and including electronic discriminator means connected to said transducer for processing said electrical signal outputs to indicate variations above a predetermined level, the improvement comprising: a variable gain amplifier circuit responsive to said electrical signal outputs for supplying a voltage output; a means summing the voltage output from the variable gain amplifier with a reference voltage of opposite polarity for supplying a resultant signal to said electronic discriminator means; means for automatically adjusting the gain of the amplifier to maintain the output of said amplifier at a constant level when yarn of substantially constant diameter is passing through the transducers; and means actuated by said discriminator means for maintaining the gain of said amplifier at a constant level when instantaneous variations in yarn diameter occur above a predetermined level.

3,986,038

SEQUENCER UNIT

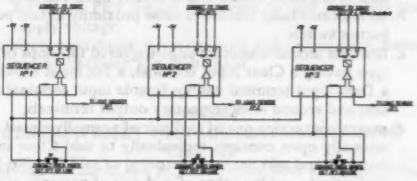
David J. Short, Klemzig, Australia, assignor to Gibson Battle & Co. Limited, Australia

Filed Apr. 2, 1975, Ser. No. 564,283

Claims priority, application Australia, Apr. 8, 1974, 7183/74

Int. Cl.² H02J *3/38*

U.S. Cl. 307—47 **4 Claims**



1. Control apparatus for energizing an electrical distribution system from a plurality of separately engine-driven alternators, at least one of the alternators serving as a base alternator initially energizing the distribution system, said control apparatus comprising a plurality of control units, one control unit associated with each alternator, and each control unit comprising:

a. monitoring means for monitoring the electrical power being delivered by the associated alternator to the distribution system;

b. analogue circuit means representing the capacity of the associated alternator by a suitable analogue;

c. interconnecting means for interconnecting the analogue circuit means of each control unit into a composite analogue system whenever the associated alternator is connected into the distribution system at any time, affording a composite analogue system continuously representative of the capacity of those alternators which are actually in operation,

d. and comparison means, comparing the load upon the associated alternator unit with the composite analogue system, for initiating starting of the next alternator when the load on the associated alternator exceeds a set proportion of its capacity, and for initiating removal of an alternator when such removal will leave the remaining alternators carrying a load of a set proportion of their capacity.

3,986,039

TOGGLE SWITCH/INDICATOR CIRCUIT

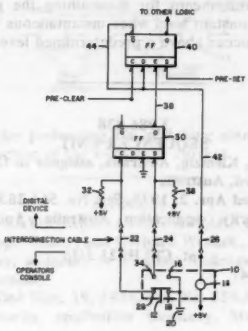
Thomas Frank Bovitz, Hibbing, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 2, 1974, Ser. No. 466,444

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² H03K *17/56*

U.S. Cl. 307—137 **4 Claims**



1. Switching apparatus comprising in combination:

a. a double-pole double-throw push-button switch having a pair of normally closed and normally open contacts;

b. an indicator lamp located in close proximity to said push-button switch;

c. first and second transition edge-triggered flip-flops of the type having a Clear input terminal, a Set input terminal, a Data input terminal and an Enable input terminal and first and second complementary output terminals;

d. means connecting one of said pair of normally closed and normally open contacts individually to said Clear input terminal and said Set input terminal of said first flip-flop respectively and the other of said pair of normally closed and normally open contacts to a common point of fixed potential;

e. means connecting said first output terminal of said first flip-flop to said Enable input terminal of said second flip-flop;

f. means connecting said indicator lamp in series circuit between a source of positive potential and said Data input terminal of said second flip-flop; and

g. means connecting said second output terminal of said second flip-flop back to the Data input terminal of said second flip-flop, the arrangement being such that the first momentary closure of said normally open contacts sets said first flip-flop and enables the toggling of said second flip-flop from its present binary state to its opposite binary state, said indicator lamp being illuminated only when said second flip-flop is in a predetermined one of its two possible states.

3,986,040

INTEGRATED CIRCUIT APPLIANCE PROGRAMMER INCLUDING PROGRAMMER MODIFICATION FUNCTION

Joseph Karklys, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sept. 17, 1974, Ser. No. 506,792

Int. Cl.² H01H *7/00, 43/00*

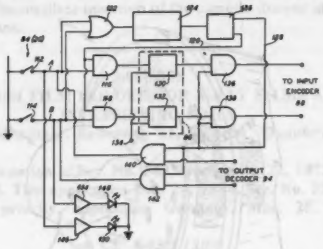
U.S. Cl. 307—141 **11 Claims**

1. In an appliance which performs a plurality of operations, an electronic control for stepping the appliance through an operating program comprising a sequence of the operations, said electronic control comprising:

a clock for supplying electrical pulses at discrete time intervals;

a sequence control for establishing a sequence of appliance operations;

a set of operator controls for modifying said sequence and including means for preventing sequence modification, after a predetermined interval, in response to operation of an operator control;



a memory circuit connected to said operator controls, to said clock and to said sequence control for generating a sequence of output signals; and

a plurality of output circuits connected to said memory circuit for performing said operations in response to said sequence of signals.

3,986,041

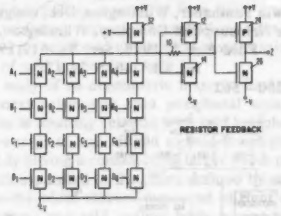
CMOS DIGITAL CIRCUITS WITH RESISTIVE SHUNT FEEDBACK AMPLIFIER

Frederick Buckley, III, Vestal; Malcom Kenneth Creamer, Jr., Endicott, and Gerald Aberdeen Miller, Owego, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,950

Int. Cl.² H03K *19/08, 19/32, 19/34, 19/36*

U.S. Cl. 307—205 **18 Claims**



1. A high performance digital circuit, comprising: an FET digital subcircuit having a plurality of input signal terminals and a subcircuit output signal node characterized by a large source capacitance;

a negative feedback amplifier in shunt feedback configuration having its input terminal connected to said subcircuit output signal node for providing a low impedance path for current around said capacitance and having an amplifier output terminal;

said feedback amplifier comprising:

a first P-channel FET device having a source connected to a relatively high supply voltage and a drain connected to said amplifier output terminal and to the drain of a first N-channel FET device having its source connected to a relatively low supply voltage;

said first P-channel FET device having a gate electrode connected to said amplifier input terminal and said first

N-channel FET device having a gate electrode connected to said amplifier input terminal;

a resistor connected between said amplifier input and output terminals;

whereby said digital subcircuit with high output capacitance can be operated at a high speed.

3,986,042

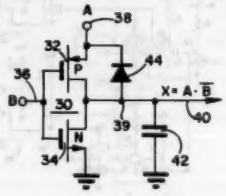
CMOS BOOLEAN LOGIC MECHANIZATION

Clarence W. Padgett, Westminster; James A. Luisi, Anaheim, and Dana C. Street, Placentia, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 23, 1974, Ser. No. 535,643

Int. Cl.² H03K *19/08, 19/12, 19/28, 19/38*

U.S. Cl. 307—205 **15 Claims**



1. A logic circuit for performing a Boolean logic function including

inverter means having first and second three-terminal opposite conductivity type semiconductor devices,

a first terminal of said first semiconductor device comprising a first inverter input terminal, said first inverter input terminal adapted to receive a first binary input signal,

a corresponding first terminal of said second semiconductor device connected to a first reference source means,

corresponding second terminals of each of said first and second semiconductor devices connected together to comprise a second inverter input terminal, said second inverter input terminal adapted to receive a second binary input signal,

an inverter output node,

corresponding third terminals of each of said first and second semiconductor devices connected together and to said inverter output node, said output node adapted to be selectively charged or discharged through said first inverter input terminal to provide an output signal indicative of the binary state of the logic to be performed, and

unidirectional current conducting means connected between said first inverter input terminal and said inverter output node and across the conduction path of said first semiconductor device.

3,986,043

CMOS DIGITAL CIRCUITS WITH ACTIVE SHUNT FEEDBACK AMPLIFIER

Frederick Buckley, III, Vestal; Gerald Aberdeen Miller, Owego, and Vincent Anthony Scotto, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,945

Int. Cl.² H03K *19/08, 19/32, 19/34, 19/36*

U.S. Cl. 307—205 **18 Claims**

1. A high performance digital circuit, comprising:

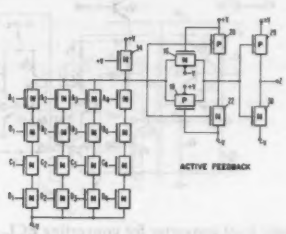
an FET digital subcircuit having a plurality of input signal terminals and a subcircuit output signal node characterized by a large source capacitance;

a negative feedback amplifier in shunt feedback configuration having its input terminal connected to said subcircuit output signal node for providing a low impedance path for current around said capacitance and having an amplifier output terminal;

said feedback amplifier comprising:

a first P-channel FET device having a source connected to a relatively high supply voltage and a drain connected to said amplifier output terminal and to the drain of a first N-channel FET device having its source connected to a relatively low supply voltage;

said first P-channel FET device having a gate electrode connected to said amplifier input terminal and said first



N-channel FET device having a gate electrode connected to said amplifier input terminal;

a second N-channel FET device and a second P-channel FET device mutually connected in parallel between said amplifier input and output terminals, with the gate of said second N-channel FET device connected to said relatively high supply voltage and the gate of said second P-channel FET device connected to said relatively low supply voltage;

whereby said digital subcircuit with high output capacitance can be operated at a high speed.

3,986,044

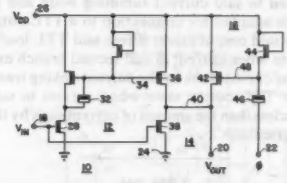
CLOCKED IGFET VOLTAGE LEVEL SUSTAINING CIRCUIT

Paul Dale Madland, and M. Clair Webb, both of Tempe, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Sept. 12, 1975, Ser. No. 612,996

Int. Cl.² H03K *19/08, 19/40*

U.S. Cl. 307—205 **1 Claim**



1. An IGFET voltage level sustaining circuit comprising;

a load IGFET having its drain coupled to supply voltage conductor means and its source connected to a first node and its gate connected to control circuit means;

a switch MOSFET having its drain connected to said first node and it source coupled to second voltage supply conductor means and its gate coupled to said control circuit means;

a first MOSFET having its drain connected to said voltage supply conductor means and its source connected to said first node and its gate connected to a second node;

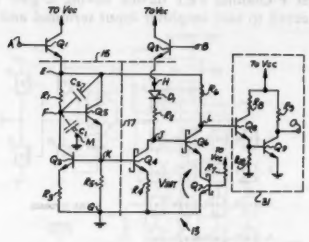
boosting capacitor means coupled between said second node and a boosting signal conductor;

a charging IGFET having its source coupled to said second node and its gate and drain coupled to said voltage supply conductor means.

3,986,045
HIGH SPEED LOGIC LEVEL CONVERTER

Robert Clare Lutz, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 23, 1975, Ser. No. 570,742
Int. Cl.² H03K 17/00
U.S. Cl. 307—207 11 Claims



1. A logic level converter for converting ECL characterized by at least first and second ECL input means for producing dual high and low ECL input signals, to a single TTL for driving a TTL load through a TTL output driver comprising,

a first circuit branch having a first input node, connected for receiving a signal from said first ECL input means, a reference node whose potential is adjustable with reference to ground and a temperature compensated, stabilized voltage dropping means between said first input and reference nodes, said input node connected to said first ECL input means.

a second circuit branch having a second input node connected for receiving a signal from said second ECL input means, a current summing node and a temperature compensated voltage dropping means between said second input and current summing node,

a current sinking transistor having a current sinking electrode connected to said current summing node of said second circuit branch, a bias electrode connected to said reference node of said first circuit branch for establishing the current sinking amount of said current sinking transistor, and an emitter electrode communicating with ground through a first resistive element,

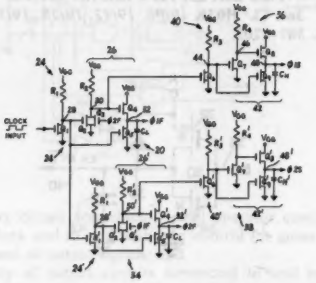
an intermediate driver transistor having an input electrode connected to said current summing node and an output electrode adapted for connection to a TTL output driver whereby said output driver drives said TTL load to a high TTL state when current in said second branch exceeds the amount of current sunk by the current sinking transistor and in a low TTL output state when current in said second branch is less than the amount of current sunk by the current sinking transistor.

3,986,046
DUAL TWO-PHASE CLOCK SYSTEM

John J. Wunner, Sayville, N.Y., assignor to General Instrument Corporation, Clifton, N.J.

Continuation of Ser. No. 274,308, July 24, 1972, abandoned.
This application Mar. 11, 1974, Ser. No. 449,939
Int. Cl.² H03K 5/15, 5/153, 23/22; G11C 19/20
U.S. Cl. 307—208 24 Claims

1. In a semiconductor circuit comprising a plurality of switching means adapted to be actuated under the control of timed clock signals and when so actuated to transfer signals therethrough, at least one of said switching means having a relatively small capacitance and requiring more usable clock time for transferring signals than others of said switching means having a relatively large capacitance in the aggregate, the improvement comprising means for generating two sets of clock signals, each set comprising a plurality of substantially out-of-phase signals and the corresponding signals of each set respectively being substantially like-phased, and means operatively connecting one of said sets of clock signals to said at least one of said switch means and the other of said sets of clock signals to others of said switching means, whereby the capacitance encountered by the clock signal generating means



in clocking said at least one switching means is less than the total capacitance of the others of said plurality of switching means thereby to provide the said at least one switching means with relatively more usable clock time for signal transfer than said plurality of switching means.

3,986,047
RAMP RELEASE AND RESET CIRCUIT FOR A THREE PHASE VOLTAGE REGULATOR

Roy K. Griess, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,441
Int. Cl.² H03K 4/08
U.S. Cl. 307—228 9 Claims

1. A ramp release and reset circuit for a three phase system comprising:

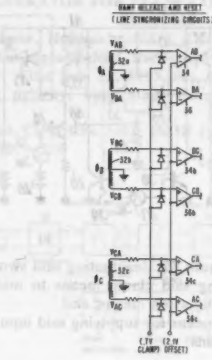
a pair of comparators for each phase of the three phase input to the system for generating two, 180° out of phase timing pulses for each phase;

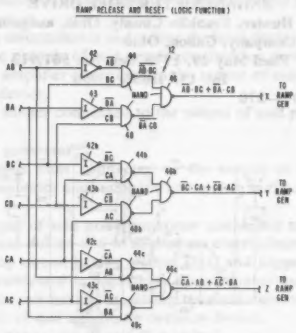
a voltage offset means associated with each comparator which raises the comparator switching point above the zero crossover point on each phase input;

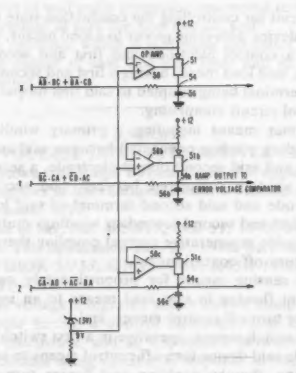
a logic circuit driven by predetermined combinations of the 180° out of phase timing pulses from each of said pair of comparators to produce output timing pulses at each output of said logic circuit in accordance with the logic in said logic circuit;

linear ramp generators, one associated with each of said

logic circuit outputs to generate linear ramps released and reset by the beginning and end, respectively, of each







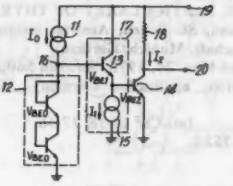
of said output timing pulses from each of said logic circuit outputs.

3,986,048

NON-LINEAR AMPLIFIER

Takashi Okada, Yamato, and Kimitake Utsunomiya, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 492,838, July 29, 1974, Pat. No. 3,935,478. This application June 18, 1975, Ser. No. 587,847
Claims priority, application Japan, Aug. 10, 1973, 48-90150; Aug. 10, 1973, 48-90151
Int. Cl.² G06G 7/20
U.S. Cl. 307—229 **4 Claims**



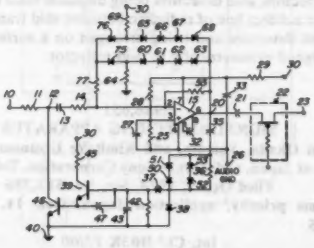
1. A non-linear amplifier, comprising an amplifying transistor; an input terminal; an input current source for supplying an input current to said input terminal; a series of *n* P-N junctions driven by said input current source for providing a predetermined bias voltage for said amplifying transistor; and (*n*-1) emitter follower transistors connected in cascade from said input terminal to said amplifying transistor, said amplifying transistor having its base-emitter junction connected in cascade with the base-emitter junctions of said cascade-connected emitter follower transistors for obtaining from said amplifying transistor an output current corresponding to the *n*-th power of said input current.

3,986,049

AUDIO COMPRESSOR/LIMITER AMPLIFIER

Whitney Robertson Campbell, Elk Grove Village, and Raymond Maurice Fardoux, Wilmette, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed June 30, 1975, Ser. No. 591,388
Int. Cl.² H03K 5/08, 1/14
U.S. Cl. 307—237 **8 Claims**



1. An audio compressor amplifier comprising:

a. an audio amplifier circuit having an output and an input;

b. compressor means connected from the output to the input of said amplifier circuit for controlling the input of said amplifier circuit to compress signals at the output to a predetermined constant level in a predetermined attack time;

c. semiconductor means connected in said compressor means for decreasing the attack time when the output signal exceeds the predetermined constant level by a predetermined amount;

d. gain control feedback means connected from the output to the input of said amplifier circuit for controlling the gain thereof; and

e. semiconductor controlled circuitry connected to the output of said amplifier circuit and said gain control feedback means for controlling said gain control feedback means to reduce the gain of said amplifier circuit when a signal at the output exceeds a predetermined value in excess of the predetermined constant level.

3,986,050

FIRING ARRANGEMENT FOR A NUMBER OF ELECTRIC VALVES, PARTICULARLY OF THYRISTORS

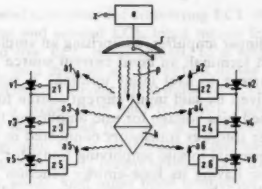
Oskar Beckmann, St. Polten, Austria, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 20, 1975, Ser. No. 560,386

Claims priority, application Germany, Mar. 25, 1974, 2414198

Int. Cl.² H03K *17/56*

U.S. Cl. 307—252 L **13 Claims**



1. A firing arrangement for firing a number of electric valves having control paths comprising:

a. a transmitter for emitting high frequency electromagnetic radiation as a parallel beam;

b. a plurality of firing circuits, each associated with a control path of one of said number of electric valves and each including a detector for detecting high frequency electromagnetic radiation; and

c. a reflector having angled surfaces terminating in a point pointing in the direction of said transmitter such that the parallel beam therefrom is incident upon said surfaces and reflected therefrom, said surfaces being selected so as to reflect said radiation toward each of said plurality of detectors, said detectors being disposed such that there is not a direct line of radiation between said transmitter and said detectors and being arranged on a surface which is aligned symmetrically to said reflector.

3,986,051

SIGNAL SWITCHING APPARATUS

Takashi Okada, Yamato, and Kimitake Utsunomiya, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 9, 1974, Ser. No. 513,386

Claims priority, application Japan, Oct. 11, 1973, 48-114225

Int. Cl.² H03K *17/00*

U.S. Cl. 307—254 **14 Claims**

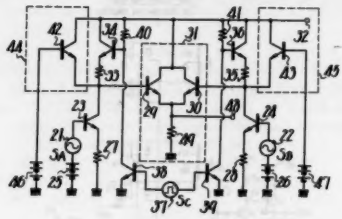
1. Apparatus for selectively switching to an output terminal a supplied input signal, comprising:

an amplifier comprising an input circuit to receive said input signal and an output circuit from which a reproduction of said input signal is available;

switch means having an input terminal connected to said output circuit for receiving said input signal and for supplying said input signal to an output terminal thereof when actuated;

clamp means coupled to the output circuit of said amplifier and the input terminal of said switch means for simultaneously inhibiting said amplifier and switch means from transmitting said input signal through to said output terminal;

control means coupled to both said switch means and said clamp means and responsive to a control signal selectively applied thereto for deactuating said switch means and for controlling said clamp means to maintain the deactuation of said switch means; and



input signal supply means for supplying said input signal to said amplifier means.

3,986,052

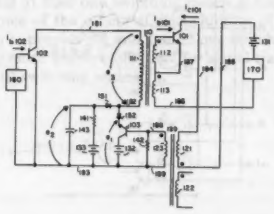
POWER SWITCHING CONTROL CIRCUIT WITH ENHANCED TURN-OFF DRIVE

Patrick L. Hunter, Franklin County, Ohio, assignor to North Electric Company, Galion, Ohio

Filed May 29, 1975, Ser. No. 581,913

Int. Cl.² H03K *17/00*

U.S. Cl. 307—270 **7 Claims**



1. A circuit for controlling the conduction state of a power switching device delivering power to a load means, said device including a control electrode and first and second output electrodes, said load means having a first and second terminal, said first terminal being coupled to said first output electrode, said control circuit comprising;

transformer means including a primary winding, a first secondary winding connected between said control electrode and said second output electrode, a second secondary winding connected between said second output electrode and said second terminal of said load means, said first and second secondary windings mutually poled to provide regenerative current coupling therebetween,

device turn-off control means,

current sensing means for proportionately coupling the current flowing in said load means to an input of said device turn-off control means, and

control switch means, operative in a first switching state to couple said device turn-off control means to said primary winding, thereby enabling said device turn-off control means, in conjunction with said transformer means, to render said power switching device non-conductive, said control switch means further operative in a second switching state to render, in conjunction with said transformer means, said power switching device conductive by

substantially isolating said device turn-off control means from said primary winding.

3,986,053

REGENERATOR FOR PULSE CODE MODULATION SYSTEMS

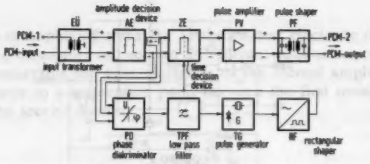
Josef Doemer, Hohenschaeftlarn, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 13, 1975, Ser. No. 549,656

Claims priority, application Germany, Feb. 19, 1974, 2407954

Int. Cl.² H03K *5/01;* **H03B** *1/00;* **H04B** *1/10*

U.S. Cl. 307—268 **8 Claims**



8. A PCM regenerator comprising:

an input transformer,

an amplitude decision device connected to said input transformer,

a phase discriminator and a time decision device connected to the outputs of said amplitude decision device,

a pulse amplifier connected to the output of said time decision device,

a pulse shaper connected to the output of said pulse amplifier,

a pulse generator,

a low pass filter connected to the output of said phase discriminator and supplying an input to said pulse generator,

the output of said pulse generator connected to said time decision device and to said phase discriminator,

a flip-flop circuit having setting, D, Q and triggering terminals contained in said phase discriminator and said flip-flop circuit having its setting terminal connected to the output of said amplitude decision device,

a diode connected to said Q terminal,

a resistor connected to said diode and said resistor connected to said low pass filter,

the output of said pulse generator connected to the triggering terminal of said flip-flop circuit, and

a quartz oscillator which is said pulse generator connected to the output of said low pass filter and its frequency controlled thereby.

3,986,054

HIGH VOLTAGE INTEGRATED DRIVER CIRCUIT

Aage A. Hansen, and Ralph D. Lane, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 405,617, Oct. 11, 1973, Pat. No. 3,898,630. This application Jan. 27, 1975, Ser. No. 544,080

Int. Cl.² H03K *5/153;* **G11C** *11/40;* **H03K** *19/08, 19/36*

U.S. Cl. 307—270 **3 Claims**

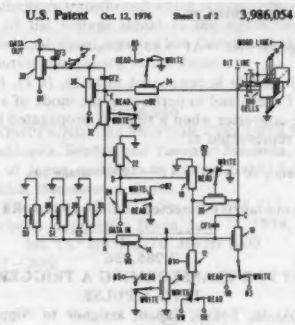
1. A high voltage integrated driver circuit comprising:

a transistor having a control electrode, first and second controlled electrodes, and an impedance between said controlled electrodes being variable in response to one of several potential levels applied to the control electrode;

means for selectively interconnecting said control electrode to one of said several potential levels thereby adjusting the impedance of said transistor to a predetermined level;

means for interconnecting said first controlled electrode to an output;

means for selectively interconnecting said second controlled electrode either to a steady state potential level or to a pulse source having one of two potential levels, one of the two potential levels of said pulse source being



sufficient to cause avalanche breakdown in said transistor; and

means connected to the control electrode of said transistor for providing a current path to prevent the accumulation of avalanche breakdown charge.

3,986,055

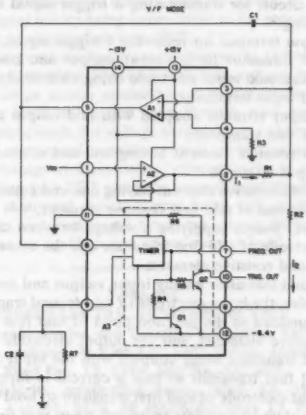
VOLTAGE-FREQUENCY AND FREQUENCY-VOLTAGE RECIPROCAL CONVERTER

Avner Barzely, Givat Shmuel, Israel, assignor to I. Jordan Kunik, New York, N.Y., a part interest

Continuation of Ser. No. 386,965, Aug. 9, 1973, abandoned. This application Feb. 17, 1976, Ser. No. 658,339

Int. Cl.² H03K *1/16, 5/20;* **H03B** *3/04*

U.S. Cl. 307—271 **9 Claims**



1. A circuit module operative selectively in either one of two conversion modes, namely, voltage-to-frequency and frequency-to-voltage, comprising an operational amplifier (A1), a voltage follower (A2) and a charge transfer circuit (A3), means for connecting a resistor (R1) between the output of (A2) and the input of (A1), means for connecting capacitor (C1) between the input and output of (A1), means for connecting a timing circuit including a capacitor (C2) and a resistor (R7) in the (A3) circuit, means for connecting a resistor (R8) between the output of (A1) and the input of (A2), means for connecting a capacitor (C3) between the

input of (A2) and ground, means for connecting a voltage reference (Vref) to (A3), and means for connecting a resistor (R2) between the output of (A3) and input of (A1), said module being operative to perform in the mode of a voltage-to-frequency converter when a signal is propagated in the sequence represented as:

voltage in →A2→A1→A3→frequency out,

when said module is connected to (R1), (C1), (C2), (R7), (R2) and (Vref); and to perform in the mode of a frequency-to-voltage converter when a signal is propagated in a reverse sequence represented as:

frequency in →A3→A1→A2→voltage out,

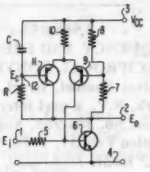
when said module is connected additionally to (R8) and (C3).

3,986,056

CIRCUIT FOR TRANSFORMING A TRIGGER SIGNAL INTO A PULSE

Kazuo Tokuda, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Apr. 9, 1975, Ser. No. 566,473
Claims priority, application Japan, Apr. 10, 1974, 49-41360
Int. Cl.² H03K *17/00*
U.S. Cl. 307—273 **6 Claims**



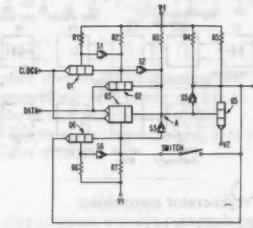
1. A circuit for transforming a trigger signal into a pulse comprising:
- an input terminal for receiving a trigger signal;
- a first transistor having input, output and common electrodes, said input electrode being electrically coupled to said input terminal;
- an output terminal coupled with said output electrode of said first transistor;
- a first resistive element having one end connected to said output terminal;
- a second resistive element having one end connected to the other end of said first resistive element;
- a power source supplying a voltage between said common electrode of said first transistor and the other end of said second resistive element;
- a second transistor having input, output and common electrodes, the input electrode of said second transistor being connected to the junction point of said first and second resistive elements, and the output electrode of said second transistor being coupled with the input electrode of said first transistor so that a current is supplied to said input electrode of said first transistor to hold the conductive state of said first transistor when said first transistor is turned to the conductive state by said input signal;
- an impedance element connected between said other end of said second resistive element and said common electrode of said second transistor;
- a capacitive element having one end connected to said other end of said second resistive element;
- a third resistive element connected between the other end of said capacitive element and said output terminal; and
- a third transistor having input, output and common electrodes, the input electrode of said third transistor being connected to the junction point of said capacitive element and said third resistive element, said output electrode of said third transistor being connected to said output terminal, and said common electrode of said third transistor being connected to said common electrode of said second transistor.

3,986,057

HIGH PERFORMANCE LATCH CIRCUIT

Edward Baxter Eichelberger, Purdy Station, and Gordon Jay Robbins, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 592,153
Int. Cl.² H03K *3/286, 19/08, 19/34, 19/38*
U.S. Cl. 307—289 **13 Claims**



1. A circuit comprising:
- a clock signal input node;
- a data input node;
- an intermediate node;
- an output node;
- first and second transistor input means connected in electrical parallel between said data input node and said intermediate node;
- third transistor input means connected between said clock signal input node and said intermediate node;
- fourth transistor input means connected between said clock signal input node and said first transistor input means, said fourth transistor input means having emitter, base, and collector regions, the emitter being connected to said clock signal input node, the collector being connected to said first transistor input means, said base being electrically coupled to a first source of fixed potential;
- transistor output means connected between said intermediate node and said output node; and
- an electrical signal feedback path connecting said output node to said second and third transistor input means.

3,986,058

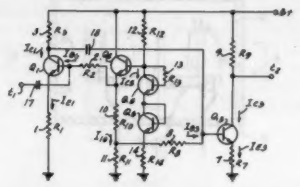
TRANSISTOR BIASING CIRCUIT

Masayuki Hongu, Komae, and Hiromi Kawakami, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,283
Claims priority, application Japan, Dec. 13, 1974, 49-143215
Int. Cl.² H03K *17/00*
U.S. Cl. 307—296 **6 Claims**

1. A transistor biasing circuit comprising: a biasing transistor having base, emitter and collector electrodes; first and second voltage terminals for being connected to a power supply source; first means for connecting the collector electrode of said biasing transistor to said first voltage terminal; a first resistance and a second means serially connected between the emitter of said biasing transistor and said second voltage terminal; a series branch including a third resistance, first and second diode connected transistors, and a fourth resistance connected between said first and second voltage terminals; first and second amplifying transistors each having base, emitter and collector electrodes; fifth and sixth resistances connected between the second voltage terminal and

the respective emitter electrodes of the first and second amplifying transistors; third and fourth means for connecting the collector electrodes respectively, of the first and second amplifying transistors to the first voltage terminal; first DC current conductive means for connecting the base electrode of



the first amplifying transistor to the emitter electrode of the biasing transistor; and second DC current conductive means for connecting the base electrode of the second amplifying transistor to a connection point between the first resistance and the second means.

3,986,059

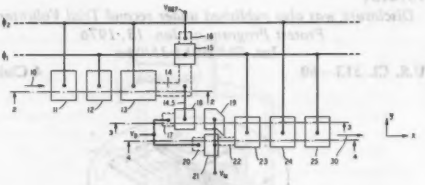
ELECTRICALLY PULSED CHARGE REGENERATOR FOR SEMICONDUCTOR CHARGE COUPLED DEVICES

Amr Mohamed Mohsen, North Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 18, 1975, Ser. No. 569,580

Int. Cl.² H01L *29/78;* **G11C** *19/28*

U.S. Cl. 307—304 **10 Claims**



1. Semiconductor apparatus which comprises

a. circuit means for applying an electrical signal to be regenerated to a signal control gate electrode overlying a signal gate semiconductor surface region, said gate region being situated between an input diode semiconductor region and an auxiliary transfer cell semiconductor region in a semiconductor medium, in order to produce a corresponding surface potential in the signal gate surface region of the semiconductor, the surface potential of first and second mutually contiguous surface portions of the auxiliary cell region being controlled by corresponding first and second portions of an auxiliary cell electrode separated by an insulating layer from said first and second surface portions respectively by first and second different thicknesses of the insulating layer, said different thicknesses thereby determining during operation a surface potential barrier in the auxiliary cell at the common boundary of the first and second surface portions, the first surface portion of the auxiliary cell being contiguous with the said signal gate surface region of the semiconductor; and

b. circuit means for electrically pulsing the diode region to a pulsed voltage level while said signal is applied to the signal control gate sufficient to cause the flow of charges from said diode through the signal gate surface region into the auxiliary transfer cell if and only if the voltage signal to the signal control gate is then less than a first predetermined level and for terminating the said pulsed voltage level, the surface potential barrier in the auxiliary cell being sufficient that a portion of the charges in the auxiliary transfer cell after termination of the pulsed voltage level flow back through the signal gate surface region into the input diode while said voltage signal is still being applied to the signal control gate thereby leaving a first quantity of charge remaining in the second portion of the auxiliary transfer cell which is indpendent of fluctuations of the voltage signal to the signal control gate provided said signal remains less than the predetermined level during the pulsing of the diode.

3,986,060

COMPOUND TRANSISTOR CIRCUITRY

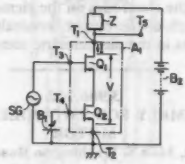
Jun-ichi Nishizawa, Sendai, and Yasunori Mochida, Hamamatsu, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed June 10, 1975, Ser. No. 585,713

Claims priority, application Japan, June 11, 1974, 49-66925

Int. Cl.² H03F *3/16;* **H02H** *9/00*

U.S. Cl. 307—304 **11 Claims**



1. A compound transistor circuit comprising:

a non-saturation type FET having a triode-like non-saturated drain voltage versus drain current characteristic, and

a saturation type FET having a pentode-like saturated drain voltage versus drain current characteristic, said non-saturation type FET being connected to said saturation type FET to form a series current path therethrough,

a drive signal source being connectible to the gate electrode of said non-saturation type FET,

a bias voltage source being connectible to the gate electrode of said saturation type FET, the bias voltage from said bias voltage source establishing a predetermined upper current level of current flow through said compound transistor circuit, the voltage versus current characteristic of said compound transistor circuit corresponding to the drain voltage to drain current characteristic of said non-saturation type FET when the current level therethrough is less than said upper current level, said current flow through said compound transistor circuit being always less than or equal to said upper current level.

3,986,061

PIEZOELECTRIC IGNITION DEVICE

Kazuma Suzuki, Fuchu, and Takahiro Kurosawa, Tokyo, both of Japan, assignors to Rion Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1974, Ser. No. 532,025

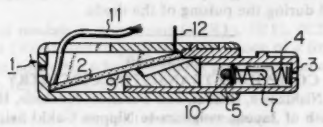
Claims priority, application Japan, Mar. 12, 1974, 49-29093[U]; Apr. 22, 1974, 49-46056[U]; May 13, 1974, 49-53128

Int. Cl.² H01L *41/08*

U.S. Cl. 310—9.8 **21 Claims**

1. A piezoelectric ignition device for igniting fuel gases comprising at least a piezoelectric element unit which comprises a straight elongated slab of piezoelectric element, a plurality of electrodes provided at least on one surface of said piezoelectric element and transversely with respect to longitudinal direction of the slab so as to divide a length of the slab into a plurality of sections, a pair of output terminals respectively connected with alternate ones of said electrodes, and an elongated slab of an elastic electrically insulative material

butted against at least one surface of said piezoelectric element, said piezoelectric element unit being fixed stationary at least at one end; a biasing means engaged to said piezoelectric element unit at least at a position remote from said fixed end of the unit so that, when a biasing force is applied to said means, the piezoelectric element unit will be bowed from its straight condition in a direction to apply a compression stress



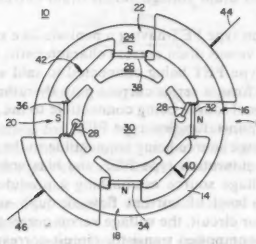
in the piezoelectric element of the unit in the longitudinal direction thereof; and a pair of stationarily spaced discharging electrodes connected respectively to each of said pair of output terminals so as to cause a spark discharge due to voltages of opposite polarities respectively between produced alternate adjacent ones of the electrodes on the element and provided as superposed to each of the output terminals depending on the compression stress in the piezoelectric element.

3,986,062

STATOR ASSEMBLY FOR TWO-POLE, SHADED POLE MOTOR

Wayne J. Morrill, 3448 S. Washington Road, Fort Wayne, Ind. 46804

Filed Jan. 31, 1975, Ser. No. 546,088
Int. Cl.² H02K *17/10*
U.S. Cl. 310—172 **7 Claims**



1. A stator assembly for a two-pole dynamoelectric machine comprising a stator core member having four inwardly extending polar projections respectively having inner ends defining a bore for receiving a rotor member, and at least one pair of field coils respectively snugly embracing an adjacent two of said projections, said pair of coils being connected so that upon energization thereof, said two projections are both polarized in the same sense.

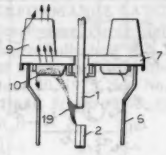
3,986,063

CARBON ARC LAMP PROVIDED WITH MEANS TO PREVENT ASH DEPOSITION

Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed June 27, 1975, Ser. No. 590,946
Int. Cl.² H01J *7/24*
U.S. Cl. 313—46 **2 Claims**

1. A carbon arc lamp for use in a light fastness tester, said lamp comprising an arc glow section, a base located at the top of said arc glow section, a heat radiating means integral with the upper side of said base, a plurality of heat collecting fins integral with the side of said base facing toward said glow section and projecting from said base toward said glow section, and a glass bulb extending from said base around said glow section, whereby the heat produced due to carbon arc discharge in the glow section is collected by the collecting means and radiated to the outside of the lamp by the radiating means aided by the convection of the outside atmosphere to hold the base at a temperature lower than that of the glass bulb so as to eliminate or reduce deposition of ash resulting



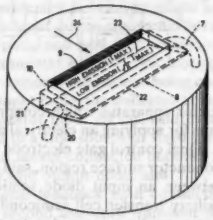
from the combustion of carbon on the light transmitting glass bulb which is at a higher temperature than the base by virtue of the tendency of the ash to be deposited to different extents depending upon temperature, to thereby ensure emission of light through the bulb at a substantially constant luminous intensity.

3,986,064

ROTARY-ANODE X-RAY TUBE

Wijbe Johannes Oosterkamp, Eindhoven, Netherlands, and Dieter Marschall, Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,706
Claims priority, application Netherlands, Oct. 15, 1973, 7314131
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² H01J *35/04*
U.S. Cl. 313—60 **4 Claims**



1. An X-ray tube having a cathode for emitting an electron beam and a rotary anode to be irradiated in a focal spot by said electron beam, comprising means for producing a current density distribution, measured along a dimension x of said spot in the direction of rotation of the anode, that decreases from a maximum value at least substantially according to $1/\sqrt{x}$.

3,986,065

INSULATING NITRIDE COMPOUNDS AS ELECTRON EMITTERS

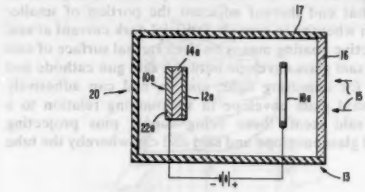
Jacques Isaac Pankove, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 24, 1974, Ser. No. 517,762
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.² H01J *39/06, 1/30, 19/24*
U.S. Cl. 313—94 **3 Claims**

1. An electron emitter comprising:

a body of an electrically insulating nitride selected from a group consisting of GaN, AlN, InN, and mixtures thereof, said body being rendered electrically insulating by doping with a material selected from a group consisting of Be,

Zn, Mg, and Li to a concentration greater than about $10^{18}/cm^3$; and



a layer of work function reducing material, on at least one surface of said body.

3,986,066

ELECTRON BEAM GENERATING SYSTEM WITH CATHODE

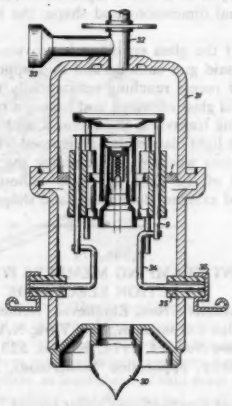
Erwin Goll, Einsingen, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Apr. 30, 1975, Ser. No. 573,091

Claims priority, application Germany, May 11, 1974, 2422884

Int. Cl.² H01J *1/88, 19/42*

U.S. Cl. 313—251 **11 Claims**



1. In an electron beam generating system including a cathode, a Wehnelt electrode, an anode, three groups of at least two electrically conductive rods, the rods of each group being connected to a respective one of the cathode, the Wehnelt electrode and the anode, a plurality of electrically insulating members each holding a respective rod, and a metal disc to which the insulating members are fastened in a manner to insulate each rod from the disc and from the other rods, the improvement wherein: said disc is in the form of a circular ring provided with a central opening and at least six additional openings disposed around the central opening; said insulating members are tubular members each having a central bore and each projecting from both sides of said disc; and each said rod is inserted in the bore of a respective insulating member, and extends at least partially through, and is fastened to, its respective insulating member.

3,986,067

ELECTRIC INCANDESCENT LAMP WITH SUPPORT STRUCTURE FOR A PLANAR FILAMENT

Dirk Jules Remi De Fraeye, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

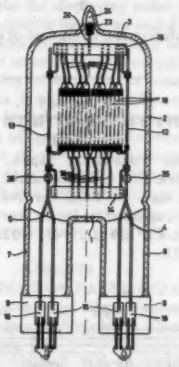
Filed Dec. 12, 1974, Ser. No. 531,929

Claims priority, application Netherlands, Jan. 21, 1974, 7400763

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² H01K *1/24*

U.S. Cl. 313—273 **2 Claims**



1. An electric lamp which comprises a glass lamp envelope having a dish-shaped bottom portion and a cavity at the opposite end thereof, said cavity being the interior of a fuse tip of a sealed exhaust tube, two generally planar filaments disposed in generally parallel relationship in said envelope, a frame carrying each filament comprising two side beams and two cross beams disposed in generally parallelogram relationship, first and second supply member extending through and sealed in said bottom portion, said first member being connected to one of said side beams and said second member being connected to the other of said side beams, means for holding said frames relative to the upper wall of the lamp envelope, said means for holding comprising a brace which includes two pieces of wire, one end of each wire being secured to one of said cross beams proximate to said upper wall, the other end of each wire being coupled together and engaging said cavity, and further including quartz bridge-shaped members extending intermediate said side beams proximate to said cross beams that are proximate to said bottom portion.

3,986,068

MINIATURE INDICATING LAMP

Paul Albrecht, Bamberg, Germany, assignor to W. Albrecht KG, Bamberg, Germany

Filed Apr. 28, 1975, Ser. No. 572,442

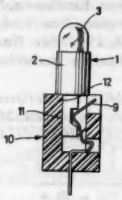
Claims priority, application Germany, Dec. 10, 1974, 2458296

Int. Cl.² H01J *5/48, 5/50*

U.S. Cl. 313—318 **4 Claims**

1. A miniature indicating lamp for insertion into a socket comprising, in combination, a upper hollow-cylindrical glass portion; a base of synthetic materials; a bottom portion on said base in a form of a flat plug; a separating wall parallel to the axis of said lamp the bottom portion of said base having bores connecting wires in said bores and extending into said upper hollow cylindrical glass portion, said bores and connecting wires being substantially at the center of said bottom portion of said base; and groove means communicating with said bores for providing access thereto, the connecting wires inserted

from said lamp into said bores of said base portion being bare and contacted directly by said grooves, said connecting wires



being free of insulation and being free of contacting bent-back sections.

3,986,069

COLOR STRIPE FILTER WITH TWO PROTECTIVE LAYERS

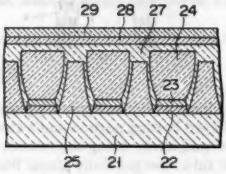
Kohei Funahashi, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 19, 1975, Ser. No. 559,879

Claims priority, application Japan, Apr. 24, 1974, 49-45453

Int. Cl.² H01J *29/45*; G02B *5/28*

U.S. Cl. 313—371 **3 Claims**



1. A spatial filter comprising a transparent substrate; filter stripes projectively formed on said transparent substrate; a first protective layer formed with a thickness of 4 to 10 microns on the substrate and also on the filter stripes projectively provided on said substrate, thereby presenting crevice-like faults along the boundary between the substrate and the filter stripes, as well as along the boundary of filter stripes adjacent each other; and a second protective layer coated 2 microns thick at most on the first protective layer to fill up said crevice-like faults, thereby presenting a smooth surface free from the crevice-like faults.

3,986,070

PICK-UP TUBES

Hans Scholz, Maldon, England, assignor to English Electric Valve Company Limited, Chelmsford, England

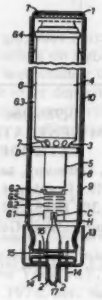
Continuation of Ser. No. 365,691, May 31, 1973, abandoned. This application Jan. 6, 1975, Ser. No. 538,940

Claims priority, application United Kingdom, June 15, 1972, 28000/72

Int. Cl.² H01J *31/38*, *29/89*

U.S. Cl. 313—384 **13 Claims**

1. In a photo-conductive target pick-up tube having an elongate, evacuated glass envelope presenting a face plate at one end of the tube and a stem at the opposite end of the tube; a target electrode deposited on the inner surface of said face plate which exhibits a natural relatively low dark current; a gun cathode disposed centrally of said tube adjacent the stem end thereof; a tubular anode electrode between said gun cathode and said target electrode and including a portion of smaller cross section extending from adjacent said gun cathode toward said target electrode and a portion of larger cross section extending from adjacent said portion of smaller cross section to said target electrode, said portion of larger cross section having an internal surface of light scattering property to provide diffused illumination of said target, and means for admitting light into the interior of said portion of larger cross section at that end thereof adjacent the portion of smaller cross section whereby to provide artificial dark current at said target; reflective coating means on the external surface of said stem end of said glass envelope between said gun cathode and said means for admitting light; and an end cap adhesively secured to said glass envelope in surrounding relation to a portion of said stem, there being supply pins projecting through said glass envelope and said end cap whereby the tube



may be employed as a direct replacement for tubes of prescribed external dimensions and shape; the improvement in which:

said stem of the glass envelope is provided with a recess between said gun cathode and said opposite end of the tube, said recess reaching substantially the longitudinal axis of said glass envelope and having a region extending along a line transverse to such axis; and

a removable light biassing lamp disposed within said region of the recess whereby to illuminate the interior of said stem end of the glass envelope without violating said prescribed external dimensions and shape.

3,986,071

RESILIENT CLAMPING MEMBERS FOR COLOR SELECTION ELECTRODE

Theodorus Cornelis Groot, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1974, Ser. No. 523,696

Claims priority, application Netherlands, Nov. 30, 1973, 7316388

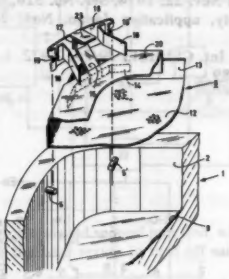
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² H01J *29/06*, *29/02*

U.S. Cl. 313—404 **2 Claims**

1. A color cathode ray tube including an evacuated envelope having a dish-shaped, substantially rectangular display screen and, within said envelope, a substantially rectangular color selection electrode disposed within and spaced apart from said screen, means for supporting said electrode comprising suspension members each connected at one end thereof to said electrode, elongate clamping members of resilient material each connected at its center to the free end of a corresponding suspension member and extending in a substantially transverse direction thereto, and pairs of metal supporting members sealed partly in the upright wall of said screen opposite the end portions of said clamping members and constituting two by two a clamping fit for each clamping member, said clamping members being adjusted for bearing upon and resiliently engaging the projecting ends of assigned

pairs of said supporting members and abutting against the inner wall of said screen, each clamping member having at its



free ends a notch which cooperates with the said supporting members.

3,986,072

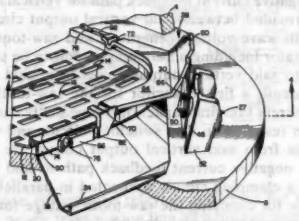
COLOR CATHODE RAY TUBE HAVING AN IMPROVED SHADOW MASK SUSPENSION SYSTEM

Alfred Adamski, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 12, 1975, Ser. No. 603,984

Int. Cl.² H01J *29/02, 29/07*

U.S. Cl. 313—404 **21 Claims**



1. In a rectangular color cathode ray tube having a faceplate and a mating funnel, a system of four suspension devices, one at each corner of the faceplate, for detachably supporting a non-self-rigid shadow mask adjacent a screen-bearing inner surface of the faceplate, at least three of said mask suspension devices each comprising mask-mounted and envelope-associated components, said device being characterized by one of said components including an axially extending, non-folded leaf spring which is cantilevered such that it deflects with an arc of motion in a plane perpendicular to the mask and which has at its distal end provision for detachably engaging a mating provision on the other of said components, said leaf spring being arranged such that the force exerted by it on the mask is through the mask substantially along a diagonal thereof so as to preclude the imposition of any substantial movement on the mask, said leaf spring having a relatively low spring rate, i.e., in flexure out of its plane, yet being very stiff in its own plane such that said three devices acting in concert precisely fix and hold a mask in a predetermined spatial position relative to the faceplate against translational or rotational displacement, in spite of any thermal expansion or contraction of the mask, demounting and remounting of the mask, or mechanical shocks, and do so without distorting or deforming the mask.

3,986,073

LUMINESCENT SCREEN OF A COLOR TELEVISION TUBE

Hans Dignus Duinker, and Gerardus Antonius Wilhelmus Vermeulen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 11, 1972, Ser. No. 279,969

Claims priority, application Netherlands, Aug. 18, 1971, 7111362

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² H01J *31/12, 29/18*

U.S. Cl. 313—477 R **1 Claim**

1. A cathode-ray tube for displaying color pictures, comprising: a transparent window having an undulated inner surface including undulations with a wavelength between 0.2 and 0.02 cm; a luminescent screen provided on said inner surface and including a plurality of luminescent areas which upon excitation by electrons luminesce in different colors, said areas being separated by light absorbing material, a shadow mask having a plurality of apertures, said apertures exceeding at least one dimension of assigned luminescent areas, said surface undulations with wavelengths between 0.2 cm and 0.02 cm having a depth less than 1 micron.

3,986,074

LUMINOUS RADIATION PANEL APPARATUS

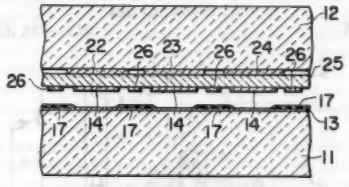
Masanori Watanabe, Katano, and Kinzo Nonomura, Kadoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 336,063, Feb. 26, 1973, Pat. No. 3,904,905. This application June 11, 1975, Ser. No. 585,838

Claims priority, application Japan, Feb. 28, 1972, 47-20880; Feb. 29, 1972, 47-21352; Nov. 22, 1972, 47-117395; Nov. 22, 1972, 47-117396; Nov. 22, 1972, 47-117397; Dec. 28, 1972, 48-3366; Dec. 28, 1972, 48-3367; Dec. 28, 1972, 48-3368

Int. Cl.² H01J *63/04*

U.S. Cl. 313—485 **3 Claims**



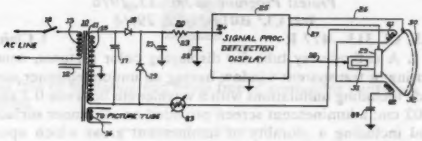
1. A panel luminous radiation apparatus of the type in which light is produced by a discharge through a space containing a gas at the respective intersections of a plurality of electrodes disposed on a substrate and another plurality of electrodes disposed on another substrate to oppose and intersect one another with said first-mentioned plurality of electrodes, wherein a plurality of phosphor stripes or dots are applied at least to one of said substrates at positions opposite to said plurality of electrodes on said one of said substrates, and a thin sheet of glass capable of transmitting ultraviolet ray therethrough is applied to said phosphors.

3,986,075

AUTOMATIC DEGAUSSING IN TELEVISION RECEIVER WITH VOLTAGE REGULATING TRANSFORMER

Hans E. Manske, Addison, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed July 2, 1975, Ser. No. 592,561
Int. Cl.² H01F 13/00
U.S. Cl. 315—8 6 Claims



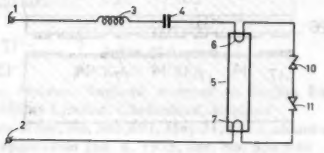
1. In combination in a color television receiver including a resonant transformer and associated tuning capacitor supplying voltage-regulated power to signal processing, deflection and display circuitry, said receiver including a color picture tube having permeable material susceptible to undesirable magnetization; an automatic degaussing circuit arrangement comprising; a degaussing coil adjacent said color picture tube for developing a degaussing magnetic field in the vicinity of said permeable material upon energization of said receiver from a cold start; a thermal element having a low resistance when cold and a high resistance when hot; and an auxiliary tuning capacitor in circuit with said resonant transformer, said thermal element and said degaussing coil for changing the tuning of said resonant transformer during the degaussing interval.

3,986,076

HIGH EFFICIENCY SUPPLY CIRCUIT FOR AN ELECTRIC DISCHARGE LAMP

Jacob Rottier, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 24, 1975, Ser. No. 552,591
Claims priority, application Netherlands, Mar. 1, 1974, 7402779
Int. Cl.² H05B 41/233
U.S. Cl. 315—99 7 Claims



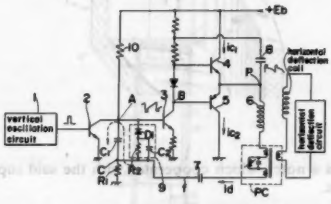
5. A supply circuit for an electric discharge lamp comprising, a pair of input terminals for applying an AC voltage of a frequency f to the supply circuit, an inductor having an inductance value L, a capacitor having a capacitance value C, means connecting the inductor, the capacitor and the lamp in series circuit across the input terminals, the operating voltage of the lamp being less than 20 percent of the effective value of the AC voltage, and wherein the inductor and capacitor are chosen so that the capacitive reactance exceeds the inductive reactance at the frequency f and the resonant frequency $(1/2\pi \sqrt{LC})$ lies between 3.5 and 4 times the frequency f of the AC voltage.

3,986,077

VERTICAL DEFLECTION CIRCUIT

Takeshi Arai, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Nov. 22, 1974, Ser. No. 526,385
Claims priority, application Japan, Nov. 24, 1973, 48-132303
Int. Cl.² H01J 29/70, 29/72
U.S. Cl. 315—389 10 Claims



1. A vertical deflection circuit in which a horizontal signal component synchronized with the horizontal synchronizing signal is applied to a vertical deflection output, said circuit comprising a vertical oscillation circuit for generating a vertical output pulse train in response to vertical synchronizing pulses applied thereto, a saw-tooth wave voltage generator which produces a series of saw-tooth signals in response to said vertical output pulses, a vertical output circuit for amplifying said saw-tooth signals and loading a vertical deflection coil, and a negative current feedback path for vertical linearity correction provided between said vertical output circuit and said saw-tooth wave voltage generator, said saw-tooth wave voltage generator including a switching circuit to be switched in response to said vertical output pulses from said vertical oscillation circuit, a first capacitor for the saw-tooth signal formation wherein said first capacitor is repeatedly charged or discharged in response to said switching circuit and wherein output signals from said vertical output circuit are applied through said negative current feedback path to said first capacitor, and a clamping circuit connected in parallel to said first capacitor for clamping the saw-tooth voltage formed by said first capacitor for a very short period of time including the completion time of the retracing period of said vertical deflection.

3,986,078

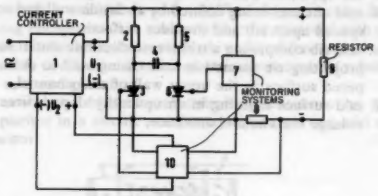
DEVICES FOR LIMITING THE OUTPUT VOLTAGE OF CURRENT-CONTROLLED REMOTE FEED APPARATUSES

Herwig Tollrian, Nurnberg, and Günter Weinfurtner, Feucht, both of Germany, assignors to Tekade Felten & Guilleaume Fernmeldeanlagen GmbH, Nurnberg, Germany

Filed May 1, 1975, Ser. No. 573,513
Claims priority, application Germany, May 10, 1974, 2422729
Int. Cl.² H02H 3/20
U.S. Cl. 317—16 4 Claims

1. A device for limiting the output voltage of a feed apparatus with control of current in the event of an interruption in a feed circuit, comprising a first resistor, a first thyristor, a second resistor, a second thyristor, a capacitor, means for triggering said first thyristor when said output voltage exceeds a limit value, a first series combination of said first resistor and said first thyristor connected together at a first junction and a second series combination of said second resistor and said second thyristor connected together at a second junction, said

first combination and said second combination being connected in parallel and said capacitor being connected between

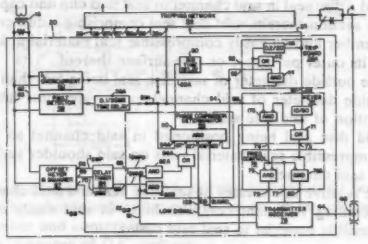


said first junction and said second junction, wherein triggering of said second thyristor serves to turn off said first thyristor.

3,986,079
OFFSET KEYING TECHNIQUE FOR SEGREGATED PHASE COMPARISON RELAYING

Walter L. Hinman, Jr., New Providence, and Russell W. Gonnam, Morris Plains, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 7, 1975, Ser. No. 548,135
Int. Cl.² H02H *7/26, 3/28*
U.S. Cl. 317—27 R **8 Claims**



1. Phase comparison relaying apparatus for an alternating current power transmission line including at least one conductor interconnecting first and second busses, said apparatus comprising:

a. first means having first and second outputs adapted to receive a signal representative of the instantaneous magnitude of current flowing in the conductor, for establishing constant upper and lower limits of a current security margin, both of said limits being established to one side of the effective zero axis of the waveform of the received signal and for generating

i. a first signal at both of its said outputs when the instantaneous magnitude of the received signal is between said upper and lower limits of said security margin,

ii. a second signal at one of its said outputs when the instantaneous magnitude of the received signal is above said limits of said security margin, and

iii. a third signal at the other of its said outputs when the instantaneous magnitude of the received signal is below said limits of said security margin; and

b. second means, adapted to reeive the signal representative of the instantaneous magnitude of current flowing in the conductor, for establishing a constant keying threshold limit to the other side of the effective zero axis of the waveform of the received signal and for generating

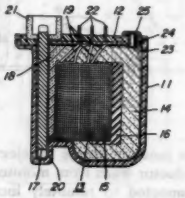
i. a first keying signal when the instantaneous magnitude of the received signal is above said keying threshold limit, and

ii. a second keying signal when the instantaneous magnitude of the received signal is below said keying threshold limit.

3,986,080
OIL-IMMERSED TYPE FLYBACK TRANSFORMER DEVICE

Sato, Kohei, Ikeda, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 390,689, Aug. 23, 1973, abandoned, which is a continuation of Ser. No. 232,566, March 7, 1972, abandoned. This application Dec. 3, 1974, Ser. No. 529,103
Claims priority, application Japan, Mar. 9, 1971, 46-12937
Int. Cl.² H01F *27/02*
U.S. Cl. 317—100 **9 Claims**

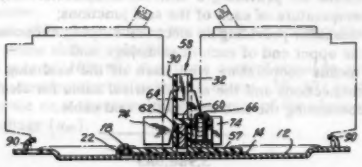


1. An oil-immersed type flyback transformer device comprising a sealed non-flexible plastic container, said container having a thermal volume expansion coefficient β; a flyback transformer assembly sealed within said container; and an insulating oil filling between said transformer assembly and said container without an air gap remaining therein, the entire internal combination within said container including said flyback transformer assembly and said insulating oil having a thermal volume expansion coefficient δ, the ratio δ/β being maintained below 2.0 for holding the internal pressure variations of said oil at substantially zero irrespective of variations in the temperature of said device.

3,986,081
PANEL FOR PLUG-IN CIRCUIT BREAKERS

Alexander R. Norden, New York, N.Y., assignor to General Switch Corporation, North Bergen, N.J.

Filed Jan. 3, 1975, Ser. No. 538,343
Int. Cl.² H02B *1/20*
U.S. Cl. 317—119 **7 Claims**



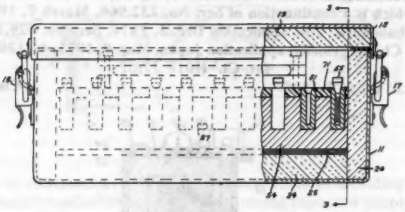
1. A circuit breaker panel comprising, a panel board having a base, a bus bar support assembly mounted directly on said base, said support assembly having therein a plurality of separate bus bar receiving recesses in alignment with each other, said recesses being bordered by laterally spaced side walls perpendicular to said base, and a bus bar disposed in each of said recesses between said side walls, respectively, each of said bus bars having opposite surfaces which are wider than the bus bar edges and are perpendicular to said base and have laterally spaced sets of terminals for engagement by plug-in terminals of a plurality of plug-in circuit breakers, respectfully, said bus bars being disposed in the space between said terminals.

3,986,082

UNIVERSAL TEMPERATURE CONTROLLED REFERENCE JUNCTION

Ronald E. Land, Monroeville, Pa., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 14, 1975, Ser. No. 550,092
Int. Cl.² H05K 7/20; H02B 1/10
U.S. Cl. 317—120 **2 Claims**



1. A reference junction device for electrically connecting a plurality of conductor leads from monitoring sensors to electrical cable connected to remotely located indicating and utilization equipment, the said junction device comprising:

a. a ferrous metallic enclosure providing environmental protection and electrical shielding;

b. a beryllium oxide block positioned in the said enclosure, the said block having a plurality of molded recesses in numerically at least a one-to-one ratio of correspondence with the said plurality of conductor leads;

c. a plurality, numerically equal to the said plurality of recesses, of oxygen-free hardened copper slugs each having an upper end and a lower end with a tapered recess positioned in the upper end of each of the said slugs and the lower end of each of the said slugs positioned in a respective recess in the beryllium oxide block;

d. a plurality of slotted plastic taper pins in numerically one-to-one ratio of correspondence with the said plurality of conductor leads, each of the said taper pins located in a respective recess of a copper slug in removable relationship, and each of the said taper pins having a bore receiving a said conductor lead and providing mechanical support to the said conductor lead;

e. means including a taper pin for forming an electrical junction between each of the said conductor leads and its respective copper slug at substantially an equal depth in each of the said copper slugs;

f. means for providing a uniform and substantially equal temperature of each of the said junctions;

g. means for providing an electrical output connection near the upper end of each of said slugs; and

h. means cooperating with each of the said slug output connections and the said electrical cable for electrically connecting the said slug to the said cable.

3,986,083

CAPACITOR CASE COVER DISC SEAL AND VENTING MEANS

John William Carino, Columbia, S.C., assignor to General Electric Company, Hudson Falls, N.Y.

Continuation-in-part of Ser. No. 441,052, Feb. 11, 1974, Pat. No. 3,904,939. This application July 7, 1975, Ser. No. 593,743
The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.
Int. Cl.² H01G 9/00, 9/16; B65D 51/16; B01J 17/00
U.S. Cl. 317—230 **4 Claims**

1. A sealed capacitor comprising in combination

a. a cup shaped cylindrical walled casing having an open upper end,

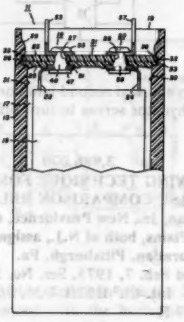
b. a capacitor section and an electrolyte in said casing,

c. a transverse circumferential channel inside of said casing and formed in the cylindrical wall of said casing adjacent the open end thereof,

d. said channel being defined by an inside wall and opposed spaced apart rib and shoulder surfaces,

e. said rib comprising a transverse circumferential inwardly projecting rib formed in said casing wall to define a tapered surface as the upper wall of said channel,

f. said surface tapering in an upwardly sloped direction to enlarge the channel entrance,



g. and a disc seal in said channel to seal said cup and capacitor section therein, said disc seal comprising a disc cover member and an easily compressible seal material at least at its outer periphery on one surface thereof,

h. the outside diameter of said disc seal being less than the inside diameter of said channel to provide some lateral motion of said disc seal,

i. said disc seal being positioned in said channel so that compressible seal material rests on said shoulder surface of said channel,

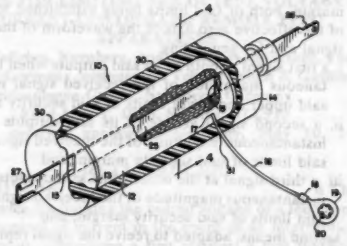
j. the relative thicknesses of said disc seal and said channel providing sufficient compressibility of said easily compressible material to seal said casing.

3,986,084

UNIVERSAL FEED THROUGH CAPACITOR

Donald J. Carter, Ortonville; Garry S. Hoffman, Royal Oak, and Thomas M. Smith, Detroit, all of Mich., assignors to Little Manufacturing Company, Troy, Mich.

Filed July 17, 1975, Ser. No. 596,761
Int. Cl.² H01G 4/42
U.S. Cl. 317—260 **5 Claims**



1. In a feed-through capacitor having a conventional winding of the type for radio frequency supression, the improvement comprising:

an elongated flat rigid conductive blade extending through said winding;

said blade having a male end and a female end externally of said winding and at opposite ends thereof;

a flexible conductive grounding lead connected to one end of said winding and having a free opposite end; and

said winding, said blade and said flexible conductive lead being encapsulated in a non-conductive material with the male blade end and female blade end and free end of said flexible conductive lead all electrically accessible relative to said encapsulation;

said conductive blade for electrically interconnecting said capacitor in a circuit and for rigidly supporting said capacitor.

3,986,085

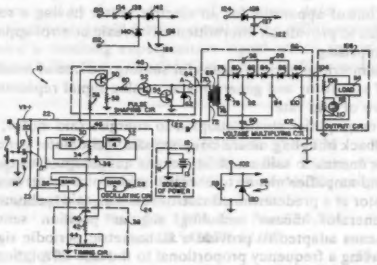
CORONA POWER SUPPLY CIRCUIT

Harold J. Weber, Sherborn, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.

Continuation of Ser. No. 532,713, Dec. 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 378,136, July 11, 1973, abandoned. This application Nov. 7, 1975, Ser. No. 629,803

Int. Cl.² H01T *19/00*

U.S. Cl. 317—262 A **32 Claims**



1. A compact high voltage corona power circuit for charging the photoconductive surface of an electrophotographic member and comprising

A. a source of D.C. voltage,

B. an oscillator connected to said source to be energized thereby,

i. said oscillator being of a construction having an inherently small power drain, and

ii. adapted when triggered by a suitable signal to become enabled whereby to produce a series of pulses,

C. a trigger circuit

i. arranged to be operated as desired to produce a trigger signal and

ii. coupled to said oscillator so that the trigger signal when produced will initiate the production of said series of pulses,

D. a timer associated with the oscillating circuit and arranged to control the number of pulses in the series and acting to disable the oscillator and stop the oscillation when said number of pulses has been produced,

E. a pulse shaper connected to the source and coupled to the oscillator to receive as an input said series of pulses and having an output, said pulse shaper

i. being constructed to convert the said pulses into transformable signals,

ii. being directly connected to said source and absorbing substantial power from the source during its operation,

iii. having circuitry keeping the same inoperative except upon receipt of said series of pulses from said oscillator and then only for a fraction of each cycle of said pulses, whereby to minimize energy drain from said source,

F. a voltage multiplying circuit coupled to and responsive to the output of said pulse shaper to raise the amplitude of the transformable signals substantially and

G. corona producing means connected to and driven by said voltage multiplying circuit.

3,986,086

CONTROL CIRCUIT FOR BRUSHLESS D-C MOTOR

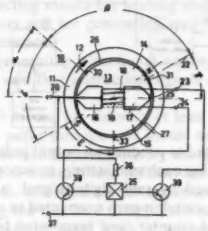
Rolf Müller, sankt Goergen, Black Forest, Germany, assignor to Papst-Motoren KG, St. Georgen, Black Forest, Germany

Division of Ser. No. 363,290, May 23, 1973, Pat. No. 3,873,897. This application Nov. 26, 1974, Ser. No. 527,345

Claims priority, application Germany, Oct. 27, 1972, 2252727

Int. Cl.² H02K *29/00*

U.S. Cl. 318—138 **11 Claims**



1. Control circuit to control the operation of a brushless d-c motor having a stator (**13, 14, 15**), a permanent magnet rotor (**11**) and

winding means (**18, 19**) on the stator to generate an electromagnetic field when energized, comprising

controlled semiconductor switching means (**38, 39**) controlling pulse current flow through the winding means;

rotor position sensing means (**25**) synchronizing pulse energization of the semiconductor switching means and hence of the winding means with the angular position of the rotor to generate, electrodynamically, an interrupted, pulsed electromagnetic torque during such pulse energization of the winding by interaction of the magnet of the rotor with the electromagnetic field due to energization of the winding means,

soft ferromagnetic means arranged on said stator for producing, in operation, a reluctance torque (M_{rel}) by interaction between said soft ferromagnetic means and said permanent magnet rotor, said reluctance torque driving said rotor during the pulse intervals of said pulsed electromagnetic torque;

means (**68, 69**) sensing induced a-c voltages (u_{70}) in the stator winding means (**18, 19**) during operation of the motor;

means (**85**) phase-shifting the sensed a-c voltages to derive a phase shifted voltage (u_{97});

and means (**100, 84**) deriving a control signal to energize the semiconductor switching means (**38, 39**) in dependence on a characteristic parameter of the phase-shifted voltage (u_{97}).

3,986,087

A.C. MOTOR CONTROL APPARATUS AND METHOD

Frank Zankl, Milwaukee; Edward E. Kirkham, Brookfield; Richard E. Stobbe, Greenfield, all of Wis., and John J. Schachte, West Hartford, Conn., assignors to Kearney & Trecker Corporation, West Allis, Wis.

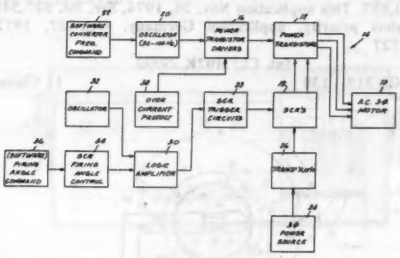
Division of Ser. No. 285,813, Sept. 1, 1972, Pat. No. 3,878,445. This application Feb. 19, 1975, Ser. No. 551,029

Int. Cl.² H02P *5/40*

U.S. Cl. 318—227 **15 Claims**

1. Apparatus for controlling a induction motor in accordance with digital input signals comprising, in combination; an input terminal for receiving a digital signal respresentative of

a voltage level to be applied to the motor, counter means connected with said input terminal and adapted to be periodically set to a predetermined condition in accordance with said digital signal, a source of an a.c. signal connected with said counter means for causing said counter means to step sequentially through its states in response to said signal at a rate proportional to the frequency of said signal, said counter



means being adapted to produce an output pulse at a predetermined time following each said setting, in accordance with the quantity represented by said digital signal, a source of a.c. voltage, rectifying switch means connected to said a.c. voltage source and to said counter, and responsive to the output of said counter for selectively rectifying said a.c. voltage to produce a d.c. voltage corresponding to said digital signal, and means for selectively applying said d.c. voltage to said motor.

3,986,088

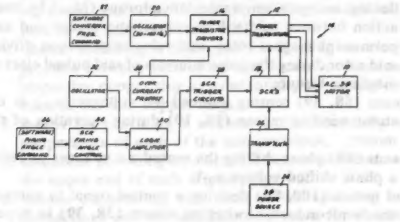
A. C. MOTOR CONTROL APPARATUS AND METHOD

Frank Zankl, Milwaukee; Edward E. Kirkham, Brookfield; Richard E. Stobbe, Greenfield, all of Wis., and John J. Schachte, West Hartford, Conn., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Division of Ser. No. 285,813, Sept. 1, 1972, Pat. No. 3,878,445. This application Feb. 19, 1975, Ser. No. 551,146

Int. Cl.² H02P *5/40*

U.S. Cl. 318—227 **6 Claims**



1. A servo system for controlling an a.c. motor having a plurality of stator field windings, comprising means responsive to command signals representative of programmed position and to signals representative of actual position for deriving a signal proportional to the torque required of the motor to follow a predetermined program, means responsive to said torque-representative signal for controlling the amplitude of an a.c. voltage applied to said motor, means for producing a speed signal proportional to the speed of operation of said motor, means for deriving from said torque-representative signal and from said speed signal a stator field position signal representative of the position of the stator field required to follow a predetermined program, and switching means connected to said stator field windings and responsive to said stator field position signal for establishing a stator field direction in accordance with said stator field position signal.

3,986,089

CONTROL APPARATUS FOR ELECTRIC MOTORS

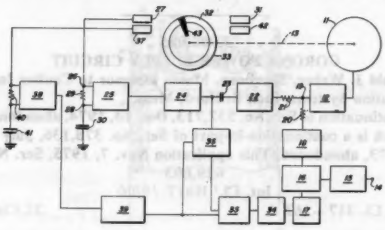
Geoffrey Sword; John Leslie Lawrence; Stephen Richard Raggett, all of Fareham, and Bernard Blakemore, London, all of England, assignors to Colourvision Associates, London, England

Filed Feb. 8, 1974, Ser. No. 440,701

Claims priority, application United Kingdom, Feb. 9, 1973, 6426/73

Int. Cl.² H02P *5/16*

U.S. Cl. 318—326 **3 Claims**



1. Control apparatus for an electric motor having a rotor arranged to provide an intermittent drive, said control apparatus comprising

tachometric generator means for sensing the rate of rotation of said rotor and generating an analog signal representative of said rate;

power amplifier means coupled to energise said motor;

feedback coupling means coupling said tachometer generator means to said amplifier means and adapted to cause said amplifier means to energise said motor to drive said rotor at a predetermined rate of rotation, said tachometer generator means including angular position sensing means adapted to provide a tachometric periodic signal having a frequency proportional to the rate of rotation of the rotor and including an indication of the intermittent movement provided by said intermittent drive means;

comparator means coupled to supply said coupling means;

timing means;

reference periodic signal input means in said comparator means coupled to said timing means to receive timing pulses therefrom;

tachometric signal input means in said comparator means coupled to receive said tachometric periodic signal, said comparator means thereby comparing said tachometric periodic signal with said timing pulses and generating a further input signal to said coupling means thereby to control said motor to synchronise said intermittent movement with a timing pulse; and

frequency divider means in said tachometer generator means, said frequency divider means being selectively adaptable to divide by either one of two possible divisors whereby said frequency of said tachometric periodic signal is selectable as one of two possible values.

3,986,090

MOTOR DRIVE FOR A PART IN AN X-RAY APPARATUS

Wolfgang Hecker; Walter Schmedemann, both of Hamburg, and Heinrich Hartmann, Reinbek, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1974, Ser. No. 529,491

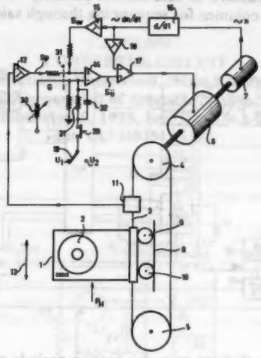
Claims priority, application Germany, Dec. 13, 1973, 2361985

Int. Cl.² G05B *11/01*

U.S. Cl. 318—488 **12 Claims**

1. A motor drive for displacing a part of an X-ray apparatus comprising, an electric motor coupled to said part, a device for controlling the speed and the direction of rotation of the motor, which device includes a force transducer for producing a first signal which depends upon the manual force exerted on the part and upon the weight of the part, the device further

including means for subtracting a second signal which corresponds to said weight of the part from the first signal to derive



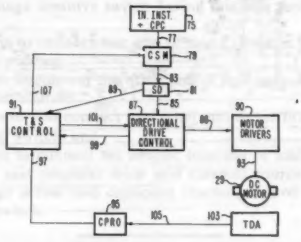
a resulting difference signal to be used for control purposes, means responsive to the motor for producing a further signal determined by the motor speed variations *dn/dt*, and means for superposing said further signal on the difference signal to derive a resulting superposition signal which serves as the desired value for an acceleration control or for a motor speed control.

3,986,091

CARRIER POSITIONING SYSTEM

Virgilio J. Quiogue, Northville; Cornelius Eldert, Ypsilanti, and John L. Worst, Belleville, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 15, 1974, Ser. No. 524,201
Int. Cl.² G05B *11/18*
U.S. Cl. 318—594 **15 Claims**



1. A carrier positioning system comprising:

carrier means for positioning a print element in either of two directions along a line of print;

D.C. motor means for driving said carrier means in either of said two directions;

means for generating first instruction signals indicative of the direction in which said motor means must be driven in order to move said carrier means from its present carrier position to a desired destination carrier position and for generating second instruction signals indicative of the number of carrier positions between said present carrier position and said desired destination carrier position;

means for generating speed selection signals in response to said second instruction signals;

means responsive to said speed selection signals for selecting a first high speed state for driving said motor means at a first predetermined carrier drive speed when said second instruction signals indicate that the number of carrier positions between said present position and said desired destination position is more than a predetermined number, and for selecting a second low speed state for driving said motor means at a second lower predetermined carrier drive speed when said second instruction signals indicate that the number of carrier positions between said present position and said desired destination position is less than or equal to said predetermined number;

first logic means for effectuating a smooth and efficient transition between said first high speed state and said second low speed state;

electronic tachometer means associated with said motor means for generating signals indicative of the actual speed of said carrier means;

second logic means responsive to said signals indicative of the actual speed of said carrier means and to said drive speed selecting means for sensing underspeed and overspeed errors and for generating speed control signals in response thereto;

means for generating directional command signals in response to said first instruction signals and said first logic means;

motor driver means for defining at least two separate current drive paths through said motor means; and

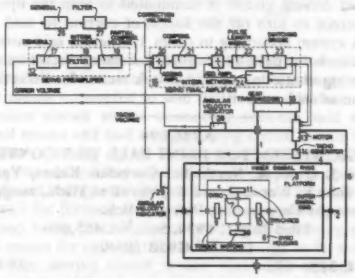
motor control means for selectively energizing and de-energizing one or more of said defined current drive paths in response to said directional command signals and for controlling the duration of application of current in said selected current drive path in response to said speed control signals for maintaining a relatively constant carrier drive speed while in either said first high speed state or in said second low speed state.

3,986,092

STABILIZATION SYSTEM FOR A PLATFORM SUSPENDED IN A GIMBAL FRAME

Sjoerd Tijsma, and Gerrit Johan Hendrik Spenkelink, both of Hengelo, Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Mar. 9, 1973, Ser. No. 339,863
Claims priority, application Netherlands, Mar. 15, 1972, 7203387
Int. Cl.² B64C *17/06*
U.S. Cl. 318—649 **2 Claims**

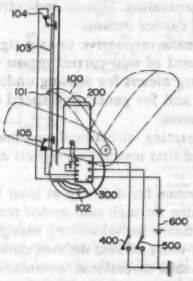


1. A system for the stabilization of a platform suspended in a gimbal frame to rotate about at least one axis, comprising a gyro hung on gimbals supported on said platform, means coupled between the gyro and the platform to derive an error signal, a combination of a motor with a tacho generator mounted on said gimbal frame and mechanically coupled to said platform to tilt it about said one axis, a servo loop including a servo-preamplifier driven by said error signal to produce a partial compensation signal, and a servo final amplifier having a plurality of inputs and an output for actuating said motor; one of said inputs being supplied by said partial compensation signal and another input by a negative feedback signal produced by said tacho generator, and an angular velocity transducer mounted on the gimbal frame outside the servo loop to generate a correction signal applied to a third input of said servo final amplifier.

3,986,093
PASSIVE SEATBELT SYSTEM

Hisato Wakamatsu; Toshihiro Kamiya, both of Toyota; Tomohisa Yoshimi, Gamagori, and Hiroshi Arai, Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed July 26, 1974, Ser. No. 492,203
Claims priority, application Japan, July 28, 1973, 48-85129
Int. Cl.² B60R *21/02*
U.S. Cl. 318—484 **6 Claims**



1. In a passive seatbelt system of the type which is driven by an electric motor, said passive seatbelt system comprising:

command switch means for detecting the presence of an occupant and generating either a seatbelt activation signal or a seatbelt deactivation signal in accordance therewith;

switch means for detecting the position of said seatbelt; and

a control circuit including a driving circuit for supplying a motor driving current to rotate said motor either in a forward direction or in a reverse direction and a computing circuit connected to both said switch means to control the operation of said driving circuit in accordance with the output signals from both switch means,

said computing circuit including circuit means whereby when the flow of current to said motor continues in excess of a predetermined time, the signal applied to said driving circuit is terminated to stop the operation thereof to turn off the supply of current to said motor.

2. A system according to claim **1**, wherein said computing circuit includes pulse-like signal processing circuit means for preventing chattering of said switch means for detecting the position of said seatbelt.

3,986,094
LOGIC SYSTEM FOR PRINT BALL TILT CONTROL

Virgilio J. Quioque, Northville; Cornelius Eldert, Ypsilanti, and John L. Worst, Grand Rapids, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed July 1, 1974, Ser. No. 485,006
Int. Cl.² G05B *19/40*
U.S. Cl. 318—696 **19 Claims**

5. An open loop digital logic system for controlled energization of selected phases of a multi-phase stepper motor for smooth rotation from a first position to a second desired position, comprising:

means for receiving data representative of said second desired position;

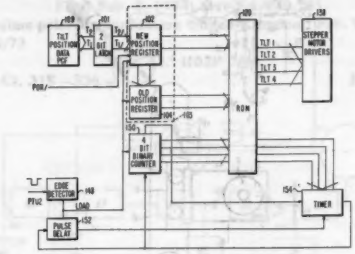
memory means for storing a plurality of memory element arrays each having a plurality of memory element rows and a plurality of memory element columns;

a first plurality of said memory element columns having data representative of said selected phases, said first plurality of memory element columns operatively coupled to said selected phases;

a second plurality of said memory element columns having data representative of predetermined timer preset values;

means responsive to said data receiving means for addressing a particular one of said plurality of memory element arrays; and

means responsive to said second plurality of said memory element columns for sequencing through said plurality of

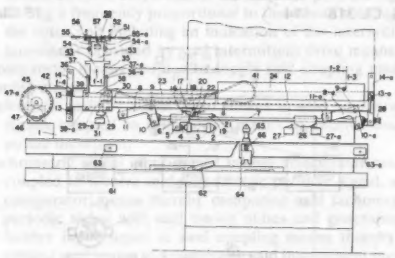


memory element rows for precise periods of time in accordance with said predetermined timer preset values.

3,986,095
APPARATUS FOR RECHARGING A SELF-RUNNING VEHICLE FOR LOADING AND/OR UNLOADING A WORKING MACHINE, EMPLOYING AS A POWER SOURCE A STORAGE BATTERY

Saburo Nakai, and Nobuyuki Koyama, both of Tokyo, Japan, assignors to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Sept. 2, 1975, Ser. No. 609,681
Claims priority, application Japan, Aug. 30, 1974, 49-98908
Int. Cl.² B60L *9/00*, *11/18*; H01M *10/46*
U.S. Cl. 320—2 **4 Claims**



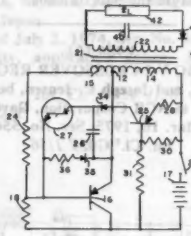
1. An apparatus for recharging a self-running vehicle for loading and/or unloading a working machine, employing as a power source a storage battery, comprising a socket means attached to the self-running vehicle; a plug means adapted to be connected with said socket means; a rail adapted to move up and down to connect and disconnect said socket means with said plug means, respectively, said plug means being adapted to reciprocatingly travel on said rail; an actuating means for actuating said rail to move up and down; a detecting means for detecting arrival of the self-running vehicle at a predetermined position to start recharging and for transmitting a signal; a signal receiving means for receiving said signal to operate said actuating means to move said rail up to connect said socket means with said plug means; a recharging means connected to said plug means for recharging said storage battery; said signal receiving means being adapted to receive a signal from another detecting means for detecting the completion of the loading and/or unloading after recharging and to operate said actuating means to move said rail down to disconnect said plug means from said socket means; and a means for returning said plug means to a starting position; said

plug means, said rail, said actuating means, said detecting means and said means for returning the plug means being attached to a frame connected to said working machine.

3,986,096
CONVERTER CIRCUIT

Wayne A. Kearsley, Chelmsford, Mass., assignor to Flash Technology Corporation of America, Nashua, N.H.

Filed May 5, 1975, Ser. No. 574,641
Int. Cl.² H02M *3/335*
U.S. Cl. 321—2 **7 Claims**



1. In a DC to DC converter having a transformer, a secondary winding on said transformer connected to feed a load, a primary winding on said transformer, means to connect said primary winding in a circuit with a DC power source and a solid state current switching amplifier, driving circuitry for said amplifier, a trigger winding inductively coupled with said primary winding and connected to the driving circuitry of said amplifier so as to turn said amplifier cyclically on and off, the combination in the driving circuitry of said amplifier comprising:

a. a capacitor;
b. a solid state current regulator as a current source;
c. a voltage sensitive switch having first and second terminals;
d. means to connect one end of said capacitor to said primary winding;
e. means to connect the other end of said capacitor to said current source;
f. means to also connect said other end to the first terminal of said switch; and
g. means to connect the second terminal of said switch to drive said amplifier from said currrent source upon the voltage across said capacitor reaching a level to trigger said switch.

3,986,097
BILATERAL DIRECT CURRENT CONVERTERS

Gordon Douglas Woods, Denville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 30, 1975, Ser. No. 591,897
Int. Cl.² H02M *3/28*
U.S. Cl. 321—2 **8 Claims**

1. A bilateral direct current to direct current voltage level converter comprising:

at least one inductive element for converting the voltage level of interrupted direct currents to a different voltage level by inductive action,

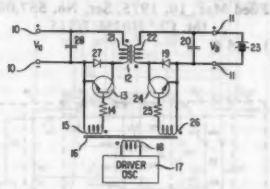
a first transistor switch having its output terminal connected to said inductive element,

a second transistor switch having its output terminal connected to said inductance element,

a source of alternating driving signals connected to the input terminals of said first and second transistor switches,

a unidirectional current conducting device connected across each of said first and second transistor switches and poled oppositely to the direction of easy conduction of the connected one of said transistor switches,

means for connecting direct current loads requiring different voltage levels to said first and second transistor switches, and

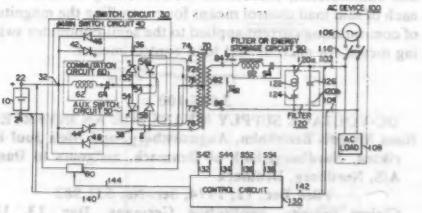


means for connecting direct current sources substantially of said different voltage levels to said first and second transistor switches.

3,986,098
POWER CONVERSION SYSTEM

Seizo Tamii, and Muneaki Takeuchi, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1974, Ser. No. 521,534
Claims priority, application Japan, Nov. 7, 1973, 48-125701
Int. Cl.² H02M *7/515*
U.S. Cl. 321—45 R **14 Claims**

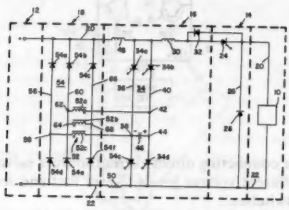


1. A power conversion system comprising, in combination, first terminal means; second terminal means; energy storing circuit means connected to said first terminal means; power conversion circuit means connected between said second terminal means and said energy storing circuit means including a first switching circuit for electrically coupling said first terminal means and said second terminal means to each other through said energy storing circuit means and a second switching circuit for forming a closed current loop, said closed current loop being electrically coupled to said energy storing circuit means for causing the electrical energy to be stored in said energy storing circuit means; means for applying AC power across said first terminal means; and means for applying DC power across said second terminal means, said power conversion circuit means further including a control circuit for responding to the application of said AC power across said first terminal means to alternately control said first and second switching circuits so that a first time period is formed during which said switching circuit forms said closed current loop to store electrical energy in said energy storing circuit means and a second time period is formed during which said closed current loop is broken to produce a DC voltage across said second terminal means in accordance with the electrical energy stored in said energy storing circuit means, said power conversion circuit means also responding to the application of said DC power across said second terminal means to produce an AC voltage across said first terminal means on the basis of the operation of said first switching circuit.

3,986,099
MULTI-PURPOSE THYRISTOR COMMUTATION CIRCUIT

William H. Beck, Palos Verdes, and Colin E. Huggett, Torrance, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 10, 1975, Ser. No. 557,009
Int. Cl.² H02M 7/515
U.S. Cl. 321—45 C 12 Claims

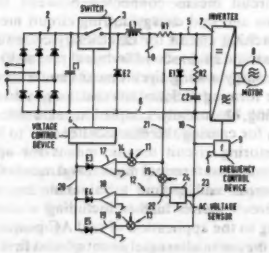


1. An electrical circuit for energizing a plurality of loads from a direct current source, said circuit comprising a plurality of load control means, each controlling energization of a load and including a triggered semi-conductor switching device and commutation diode means connected across said semi-conductor switching device, a single commutation circuit means connected across the direct current source and said load control means for producing commutating current pulses to reverse bias said semi-conductor switching devices, and commutation inductance means serially connected with each of said load control means for controlling the magnitudes of commutating current applied to the semi-conductor switching means for each of said load control means.

3,986,100
DC-VOLTAGE SUPPLY MEANS FOR AN INVERTER

Hans Mogens Beierholm, Augustenborg, and Niels Juul Henriksen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Dec. 12, 1974, Ser. No. 531,982
Claims priority, application Germany, Dec. 13, 1973, 2361924
Int. Cl.² H02P 7/44
U.S. Cl. 323—17 10 Claims



1. In a DC supply circuit for supplying a DC voltage to an inverter driving a motor, said DC supply circuit comprising

an electronic switch, a control device adapted to switch said electronic switch on and off to provide a pulsed DC output,

a filter connected to said electronic switch to smooth said pulsed DC output to provide on a pair of leads said DC voltage to be supplied to said inverter,

and a current sensor connected to sense the DC current supplied to said inverter and operative to cause said control device to control switching of said electronic switch in such a manner as to keep said current constant; the improvement

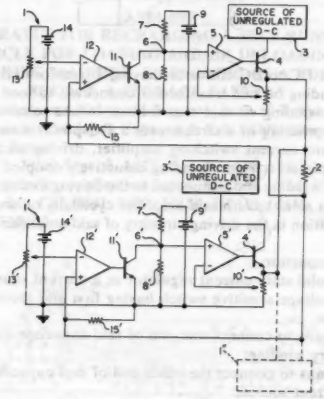
comprising an AC voltage sensor connected between said pair of leads and

a control element connected to said AC voltage sensor and to said control device and responsive to detection by the voltage sensor of an AC voltage component between said pair of leads to over-ride said constant current operation of said electronic switch provided by said control device and to cause said control device to control switching of said electronic switch in such a manner as to vary said DC voltage on said pair of leads to counteract said AC voltage component on the pair of leads.

3,986,101
AUTOMATIC V-I CROSSOVER REGULATOR

Philip W. Koetsch, and Joseph C. Jensen, both of San Diego, Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 10, 1975, Ser. No. 556,839
Int. Cl.² G05F 1/56
U.S. Cl. 323—20 5 Claims



1. A regulated d-c power supply adapted to operate in parallel with one or more additional power supplies schematically identical thereto to provide voltage regulated direct current to a single load comprising:

A. a source of unregulated d-c;

B. regulating transistor means disposed in series between said source and the load;

C. a first differential amplifier having an output terminal coupled to said regulating transistor means for controlling the conduction thereof, said first differential amplifier further including first and second input terminals;

D. means for setting up a first reference potential;

E. means coupling said first reference potential to said first input terminal of said first differential amplifier;

F. voltage sensing means for developing a load voltage signal which constitutes a potential proportional to the voltage applied to the load;

G. means coupling said load voltage signal to said second input terminal of said first differential amplifier;

H. a second differential amplifier having an output terminal and first and second input terminals;

I. means for setting up a second reference potential;

J. current sensing means for developing a load current signal which constitutes a potential proportional to the current provided to the load by said power supply;

K. means coupling said second reference potential to said first input terminal of said second differential amplifier;

L. means coupling said load current signal to said second input terminal of said second differential amplifier; and

M. variable impedance means coupled between said output terminal of said second differential amplifier and said means for setting up a first reference potential for effecting modification to said first reference potential in response to a change in an output signal from said second differential amplifier.

3,986,102

LOW LOSS STABILIZED POWER SUPPLY CIRCUIT

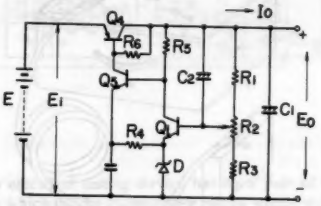
Takahiko Morita, Sayama, Japan, assignor to Hitachi Electronics, Ltd., Japan

Filed July 2, 1974, Ser. No. 485,283

Claims priority, application Japan, July 6, 1973, 48-79685[U]

Int. Cl.² G05F 1/56

U.S. Cl. 323—22 T **4 Claims**



1. In a stabilized power supply circuit comprising a series control transistor, an error detecting circuit for detecting variations in the output voltage including a reference voltage setting diode and a voltage dividing circuit connected in parallel with a load, an output of the voltage dividing circuit being compared with the reference voltage, and another transistor of the opposite polarity to said series control transistor, the collector of said another transistor being connected to the base of said series control transistor, the improvement wherein the emitter of said another transistor is connected through a resistor to said reference voltage setting diode.

3,986,103

MONITORING CIRCUIT FOR A PLURALITY OF VALVES

Wolfgang Frankenberg, and Claus Lentz, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 5, 1974, Ser. No. 529,924

Claims priority, application Germany, Dec. 5, 1973, 2360659

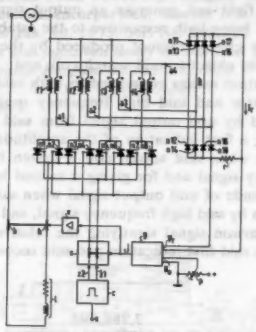
Int. Cl.² G05F 5/00

U.S. Cl. 323—24 **16 Claims**

1. A monitoring circuit for a plurality of parallel current carrying valves, each valve having a control terminal connected to a control circuit by way of a control line, said parallel valves being in series with an a.c. load line, comprising

a plurality of current transformers wherein each of the transformers has its primary winding connected in series with at least one of the valves and has its secondary winding connected to all other secondary windings in series forming a ring by means of intermediate taps,

a bridge circuit comprising a plurality of parallel-connected legs, one associated with each of said transformers, wherein each leg comprises two series connected auxiliary valves wherein each center tap of said series connected valves is connected to said intermediate tap of the associated transformer, and



means for measuring current flow from the parallel-connected legs.

3,986,104

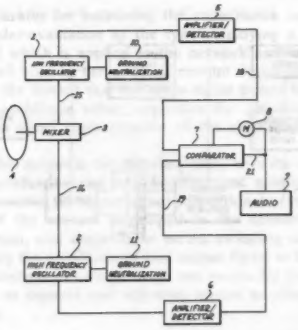
DUAL FREQUENCY METAL DETECTOR SYSTEM

Byron B. Randolph, Jr., Phoenix, Ariz., assignor to Robert F. Gardiner, Phoenix, Ariz.

Filed Jan. 19, 1976, Ser. No. 650,250

Int. Cl.² G01V 3/08

U.S. Cl. 324—3 **11 Claims**



1. Apparatus for detecting metallic objects near the surface of the earth, said apparatus comprising in combination:

a. a low frequency oscillator for generating a low frequency signal, said low frequency oscillator having a series resonant circuit tuned to a first frequency and a parallel resonant circuit tuned to a second frequency different from said first frequency, wherein one of said series and parallel resonant circuits is connected to provide a feedback signal in said low frequency oscillator;

b. a high frequency oscillator for generating a high frequency signal, said high frequency oscillator having a series resonant circuit tuned to a third frequency and a parallel resonant circuit tuned to a fourth frequency different from said third frequency, wherein one of said series and parallel resonant circuits is connected to provide a feedback signal in said high frequency oscillator;

c. a mixer means connected to said low frequency oscillator and to said high frequency oscillator for receiving said low frequency signal and said high frequency signal while isolating said low frequency oscillator and said high frequency oscillator from each other;

d. a search coil inductively coupled to said mixer means and driven by said low frequency signal and said high frequency signal to concurrently establish an electromagnetic field and generate an output signal, said output signal being both responsive to the established field and to any change thereof produced by the proximity of a metallic object to said search coil; and

e. an output means connected to both said low frequency oscillator and said high frequency oscillator and controlled by said output signal from said search coil for giving a first indication of the amplitude of said output signal when said search coil is driven by said low frequency signal and for giving a second indication of the amplitude of said output signal when said search coil is driven by said high frequency signal, and for producing a comparison signal signifying the relative amplitude between said first indication and said second indication.

3,986,105

DUAL PURPOSE ELECTROMAGNETIC THICKNESS GAUGE

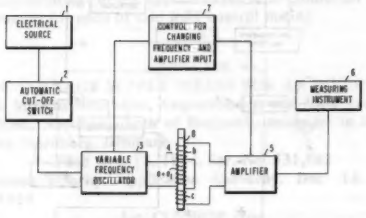
Hans F. Nix, Cologne, and Erich Steingroever, Bonn, both of Germany, assignors to Elektro-Physik, Hans Nix & Dr. -Ing. E. Steingroever KG, Cologne, Germany

Filed Feb. 14, 1975, Ser. No. 550,127

Claims priority, application Germany, Mar. 2, 1974, 2410047

Int. Cl.² G01R 33/12

U.S. Cl. 324—34 TK **22 Claims**



1. In a dual purpose probe means for electromagnetic thickness gauges, the combination including an elongated ferromagnetic core means, electrical energizing and measuring coil means inductively coupled with said core means, and means for selectively energizing said energizing coil means at one frequency for measuring the thickness of a layer of non-magnetic material on a magnetic supporting base and vice versa, and for energizing said coil means at a second higher frequency for measuring the thickness of a layer of electrically non-conductive material on an electrically conductive supporting base and vice versa, an electrical characteristic generated in said measuring coil means at said one frequency being variable as a function of the magnetic conductivity of the flux path between said core means and the magnetic material, an electrical characteristic generated in said measuring coil means at second frequency being variable as a function of eddy currents induced in the electrically conductive material, said measuring coil means being positioned concentrically with respect to said elongated core means and having a diameter such that the influence of the core means is decreased at said second frequency and the electrical characteristic generated in said measuring coil means by eddy currents is predominant.

3,986,106

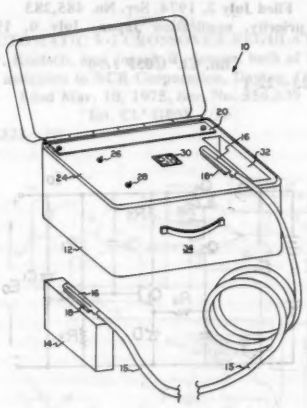
PORTABLE SET FOR AUTOMATIC SEQUENTIAL TEST OF MULTIPLE WIRE PAIRS

Edward E. Shuck, 545 Eureka, San Francisco, Calif. 94114, and Neil Hudson, 90 Nido Ave., San Francisco, Calif. 94115

Filed Mar. 31, 1975, Ser. No. 563,726

Int. Cl.² G01R 31/02

U.S. Cl. 324—51 **10 Claims**



7. A self-contained portable cable test set connected at each end to the wires of a communication cable of multiple wire pairs including in combination:

a master unit connected to said pairs at a local end of said cable and a remote unit connected to said same pairs at a remote end of said cable;

pulse generator means in said master unit for generating a sequence of pulses of substantially equal magnitude, there being a separate pulse generated for each wire pair of the cable to be tested therewith;

digital logic means connected to said pulse generator means in said master unit for sequentially gating each pulse to a preselected one of the tip or ring wires of each said pair to produce a test pulse and simultaneously to one of a series of reference resistors to produce a reference pulse;

network means in said remote unit including a line test resistor of preselected value equal to a said reference resistor with which it corresponds, said line test resistor interconnecting the tip and ring wires of each said pair, each line test resistor having a value differing from every other line test resistor and which value is substantially greater than the resistance of the said pair interconnected thereby;

pulse magnitude analog comparator means connected to said reference resistors, the other of the tip or ring wires of each said pair and to said digital logic means, said comparator means for testing each said pair by comparing the amplitude of a reference pulse with a test pulse from a said pair undergoing test and verifying correct, nonshorting connections of said pair when said pulses are of substantially equal magnitude and inhibiting sequencing of said digital logic means if said compared pulses are not of substantially equal magnitude.

3,986,107

RESISTANCE INDICATING ELECTRICAL TESTING EQUIPMENT FOR TESTING INSULATION UNDER HIGH VOLTAGE CONDITIONS

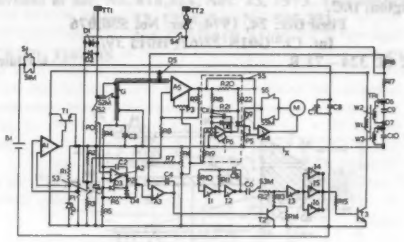
Alan Scott Dickson, Strathaven, and James Rodger Campbell Leitch, Glasgow, both of England, assignors to Edgcumbe Peebles Limited, Glasgow, England

Filed Jan. 20, 1975, Ser. No. 542,513

Claims priority, application United Kingdom, Jan. 19, 1974, 2618/74

Int. Cl.² G01R 31/12, 27/02; G05F 1/10

U.S. Cl. 324—54 13 Claims



1. An electrical testing device having a pair of terminals between which can be connected a circuit whose insulation is to be tested, power supplying means for supplying an electrical voltage to the terminals, means for generating first and second electrical signals dependent on the electrical current supplied through the terminals by the power supplying means, means for measuring and indicating the value of the first electrical signal, means for receiving and sensing said second electrical signal, control means for controlling the power supplying means, means for connecting the power supplying means and said signal generating means to said terminals so that the signal generating means detects the terminal current so as to enable the generation of said first and second electrical signals, means for connecting the measuring and indicating means to said signal generating means so that said measuring and indicating means receives said first electrical signal and indicates the measured value of the first electrical signal, means for connecting the sensing means to said generating means so that said sensing means receives the second electrical signal, the sensing means producing a third electrical signal dependent on said second electrical signal in accordance with a characteristic comprising at least one substantially linear portion, means for connecting the control means to the sensing means so that said control means receives the third electrical signal and to the power supplying means so that said control means receives a fourth electrical signal representative of the terminal voltage from the power supplying means and compares the third and fourth electrical signals to produce a fifth electrical signal dependent on the comparison, the control means being further connected to the power supplying means to supply the fifth electrical signal to the power supplying means so as to control the latter in a manner such that the terminal voltage-current characteristic depends on said third electrical signal and comprises at least one substantially linear portion, said characteristic extending from a predetermined terminal voltage value and substantially zero terminal current to a predetermined terminal current value and substantially zero terminal voltage, at least one end portion of said characteristic corresponding to a constant rate of decrease in terminal voltage with an increase in terminal current and terminating at said predetermined terminal current value.

3,986,108

APPARATUS AND METHOD FOR MEASURING CAPACITANCE

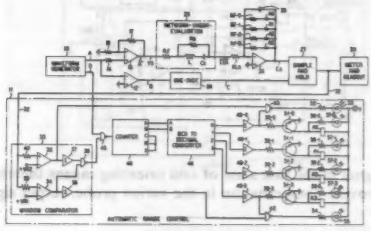
Edwin Paul Thomas, Brick Town, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 10, 1975, Ser. No. 540,218

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² G01R 27/26

U.S. Cl. 324—60 C 3 Claims



1. In apparatus for measuring the capacitance value of a network-under-evaluation of the type employing a periodic ramp signal which is applied to the network and means for sampling and holding the value of current developed in the network at the instant that the ramp signal passes through a prescribed amplitude value, apparatus for obtaining range control of a signal representative of the capacitance value comprising,

controllable means in circuit relationship with the network-under-evaluation and said sampling and holding means for generating an output signal proportional to the amplitude of the current developed in the network-under-evaluation, said controllable means including means for adjusting the amplitude of said output signal to be within a predetermined voltage range and means for generating signals to control said adjusting means to effect range control.

3,986,109

SELF-CALIBRATING DIMENSION GAUGE

Noel S. Poduje, Needham Heights, Mass., assignor to ADE Corporation, Watertown, Mass.

Filed Jan. 29, 1975, Ser. No. 545,111

Int. Cl.² G01R 27/26

U.S. Cl. 324—61 R 12 Claims

1. A system for compensating the output of a dimension gauging probe including:

a dimension gauging probe;

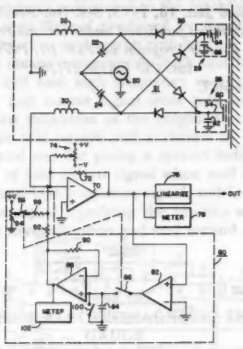
means for orienting said probe and having first and second states, the first state orienting said probe toward a work object and the second state orienting said probe toward a reference dimension;

means for energizing said probe to provide a probe output signal representative of a dimension gauged thereby;

means for varying the value of the probe output signal in response to a control signal;

means for developing said control signal to provide a predetermined value corresponding to said reference dimen-

sion in the varied probe output signal in the second state of said orienting means and for maintaining said control



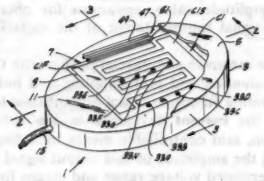
signal in the first state of said orienting means thereby to provide compensation in the varied probe output signal.

3,986,110

WATER DEPTH MEASURING DEVICE

Wilson W. Overall, Warson Woods, and Jerry R. Waldman, Manchester, both of Mo., assignors to Surface Systems, Inc., St. Louis, Mo.

Filed Aug. 29, 1975, Ser. No. 609,019
Int. Cl.² G01R 27/26
U.S. Cl. 324—61 R **15 Claims**



1. A device for use in determining the depth of water accumulating on the surface of a pathway, such as an airport runway or the like, comprising:

a block of electrically insulative material adapted to be embedded in a pathway with the top surface of the block being substantially flush with the pathway surface and exposed to atmospheric precipitation;

a sensor comprising first and second capacitors each of which has first and second coplanar spaced apart electrodes, said sensor being positioned within said block with the electrodes of the first cacpacitor positioned adjacent to and inclined with respect to the top surface of the block and the electrodes of the second capacitor being positioned a substantially greater distance from the top surface of the block whereby an accumulation of water on the surface of the block affects the dielectric, capacitance and conductance of the first capacitor without substantially affecting the dielectric, capacitance and conductance of the second;

means for applying respective out-of-phase time-varying electrical signals to the first electrodes of the afore-said capacitors as the input to the sensor; output means commonly connected to the second electrodes of the afore-said capacitors for supplying an electrical output signal relative to electrical ground from the sensor; and

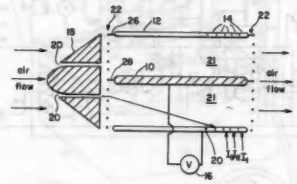
at least one electrical conductor within the block adapted to be connected to electrical ground with one portion thereof exposed to atmospheric precipitation at the top surface of the block whereby accumulation of water on the surface thereof affects the capacitance and conductance between the output means and electrical ground whereby the amplitude of the electrical output signal of the sensor is a function of the depth of water accumulating on the surface of the pathway.

3,986,111

INVERTED VOLTAGE GERDIEN CONDENSER

Bach Sellers, Sudbury, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 24, 1974, Ser. No. 536,076
Int. Cl.² G01N 27/62; H01J 39/34
U.S. Cl. 324—71 R **6 Claims**



1. A spectrometer for measuring the densities of charged particles in the atmosphere comprising:

a cylindrical, center electrode having a small-radius;

a cylindrical, outer electrode having a radius substantially larger than said center electrode and located concentrically around said center electrode to form a chamber;

means for producing an electric field in said chamber radially between said center and outer electrodes such that the charged particles to be measured, upon entering said chamber, are attracted to said outer electrode; and

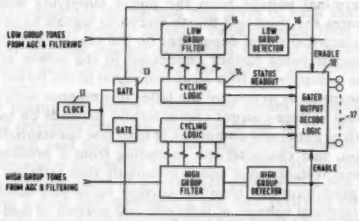
means for covering one end of said chamber, said means containing an annular opening with a small radius relative to the radius of said outer electrode for providing a low-turbulence opening for the entrance of the charged particles to be measured.

3,986,112

NOVEL TECHNIQUE FOR FREQUENCY DETECTION UTILIZING SWITCHING FILTERS

Thomas Allan Hamilton, 222 Newkirk Road, Richmond Hill, Ontario, Canada

Filed Feb. 19, 1975, Ser. No. 550,912
Claims priority, application United Kingdom, Feb. 20, 1974, 7760/74
Int. Cl.² G01R 23/02
U.S. Cl. 324—78 R **3 Claims**



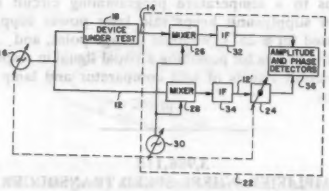
1. A frequency detection device adapted to detect in which of a plurality of frequency bands an input signal occurs, com-

prising a band pass filter, means for scanning the filter through the different bands in turn in order to select from the input signal the output signals in each of the bands, detecting means responsive to said output signals to stop the scanning action of the scanning means, and an indicator actuated only by the stopping of the scanning action to indicate the frequency band in which the input signal has occurred.

3,986,113
TWO CHANNEL TEST INSTRUMENT WITH ACTIVE ELECTRONICPHASE SHIFT MEANS

Hugo Viflan, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 418,324, Nov. 23, 1973. This application Sept. 12, 1974, Ser. No. 505,291
Int. Cl.² G01R *25/00*
U.S. Cl. 324—85 **9 Claims**



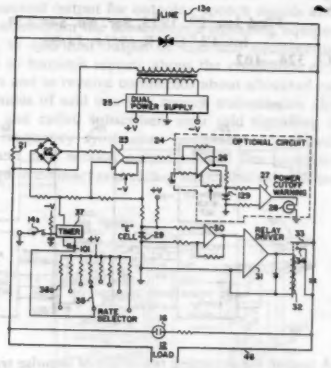
1. A two channel, a.c. test instrument comprising:
- a first signal channel for carrying a first test signal and including a first frequency converter for converting the first test signal to an intermediate frequency;
- a second signal channel for carrying a second test signal and including a second frequency converter for phase coherently converting the second test signal to the same intermediate frequency;
- measurement means for measuring the relative values of the converted first and second test signals; and
- electronic phase shift means connected in series with the second signal channel between the second frequency converter and the measurement means for shifting the phase of the converted second test signal as a function of the frequency of the second test signal.

3,986,114
WATT-HOUR COUNTER

John E. Hare, Erie, Pa., assignor to Firetrol, Inc., Erie, Pa.

Filed May 29, 1975, Ser. No. 581,617
Int. Cl.² G01R *27/22*
U.S. Cl. 324—94 **9 Claims**

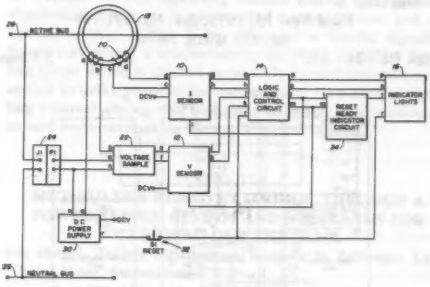
1. A watt-hour counter for supplying electrical energy at a remote location from an external power source comprising:
- a housing having a connection to an external source of electrical power;
- at least one electrical output mounted externally in said housing;
- current measuring means serially connected between the external power source and said electrical output, for producing an output potential proportional to the current in said electrical output;
- a rechargeable coulometer coupled to the output of said current measuring means, said current measuring means removing a predetermined magnitude of charge from said coulometer proportional to the ampere-seconds used in said external power lines;
- a charging circuit coupled to said coulometer for charging said coulometer with a predetermined charge; and
- switch means serially connected between said external power source and said output and coupled to said coulometer for interrupting the power to the output in response to a change in potential of said coulometer.



3,986,115
TRANSIENT DIRECTION DETECTOR

Kwang-Ta Huang, Port Hueneme, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 20, 1975, Ser. No. 542,478
Int. Cl.² G01R *19/14, 31/08*
U.S. Cl. 324—102 **12 Claims**

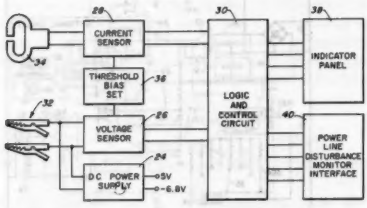


1. A system for detecting the origin of a transient in a line comprising:
- a. means for detecting and sampling the transient current;
- b. means for detecting and sampling the transient voltage;
- c. logic means for comparing the transient current sample with the transient voltage sample; and
- d. indicating means receiving the output of the logic means and indicating in which direction the transient occurred from the point where the transient current sample was taken.

3,986,116
TRANSIENT SOURCE AND DIRECTION OF PROPAGATION DETECTOR

Maurice N. Smith, Oxnard, and Kwang-Ta Huang, Port Hueneme, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1975, Ser. No. 544,428
Int. Cl.² G01R *19/14, 31/08*
U.S. Cl. 324—102 **12 Claims**

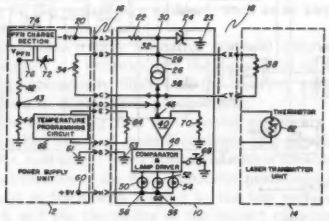


1. A system for detecting the origin of impulse transients on a line comprising:
   a. transient current sensing means;
   b. transient voltage sensing means;
   c. means for setting the threshold level of the transient current and voltage sensing means;
   d. logic means for comparing the sensed transient current and voltage; and
   e. indicating means activated by said logic means to indicate the direction of origin and polarity of the transient.

3,986,117
DEVICE FOR ADJUSTING LASER SYSTEM PULSE FORMING NETWORK VOLTAGE ON REPLACEMENT OF POWER SUPPLY OR RECEIVER TRANSMITTER UNIT

Stephen M. Fry, Woodland Hills, and Himeo B. Masuda, Gardena, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 13, 1975, Ser. No. 631,797
Int. Cl.² G01R *19/16*
U.S. Cl. 324—133 **5 Claims**

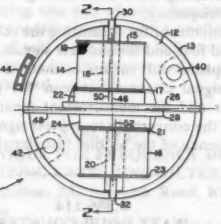


1. A test apparatus for adjusting a pulse forming network voltage of a tank laser range finder system without requiring a laser to be test fired after said range finder has had its power supply and/or receiver/transmitter unit repaired or replaced which comprises:
   housing means for holding circuit components of said test apparatus;
   connector means for electrically and mechanically coupling said circuit components of said housing means to said range finder system;
   a pulse forming network resistor being positioned in said power supply and electrically coupled to said test apparatus via said connector means;
   a "select" resistor being positioned in said receiver/transmitter unit and electrically coupled to said test apparatus via said connector means;
   means for regulating a constant negative voltage;
   means for providing a constant reference current which sums the currents through said network resistor, said "select" resistor and from said power supply;
   operational amplifier means, connected to the output of said constant current means, for summing the currents at its input terminal and for changing output states for different input polarities;
   comparator and lamp driver means electrically coupled to the output of said operational amplifier means for sensing low, high and null signals generated by said operational amplifier means and generating output signals in response thereto;
   resistance means for replacing a bypassed thermistor located in said receiver/transmitter unit, wherein said resistance means when electrically coupled by said connector means to a temperature programming circuit in said power supply unit keeps said laser power supply unit adjusted for a 25° C nominal voltage point; and
   indicating means for providing a visual signal in response to the output signals of said comparator and lamp driver means.

3,986,118
SIMPLIFIED WHEEL SPEED TRANSDUCER

Basil M. Madigan, Wadsworth, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed May 2, 1975, Ser. No. 574,154
Int. Cl.² G01P *3/48;* **H02K** *17/42*
U.S. Cl. 324—174 **6 Claims**



1. A wheel speed transducer for sensing the rotational speed of a wheel about an axle, comprising:
   a housing adaptable for being fixedly secured to the axle;
   two permanent magnet disks received within the housing;
   at least one elongated pole piece commonly abutting a first surface of each of said magnet disks, said surfaces being of like polarity;
   two inductive coils have flux-conductive cores axially passing therethrough, each magnet disk being abutted by a core on a second surface thereof in substantially perpendicular relationship therewith, the second surface of said magnet disks being of like polarity with respect to each other and of opposite polarity with respect to the first surfaces; and
   two pole pieces, one connected to the end of each of the cores opposite the ends of the cores abutting the magnet disks.

3,986,119

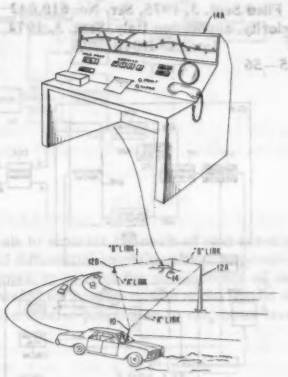
EMERGENCY COMMUNICATION SYSTEM

Nicholas Howard Hemmer, Jr., Poughkeepsie, N.Y., and Agis Demetrius Valakos, Bethesda, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,241

Int. Cl.² H04B 7/00

U.S. Cl. 325—3 5 Claims



5. An emergency communication system having a terminal station with a relay station identification decoder means for receiving and decoding a plurality of identification signals transmitted thereto by respective ones of a plurality of relay stations, said relay station identification signals each being transmitted together with a relayed coded message from a portable transceiver, said relay station identification decoder means providing a plurality of output signals each indicative of reception of a particular relay station identification signal, and said terminal station further including display means and relay selection logic circuit means for receiving said plurality of output signals to determine the location of said portable transceiver, said relay selection logic circuit means comprising:

event buffer means for storing and circulating said plurality of output signals;

a plurality of logic circuits connected to said event buffer means for determining the location of said relay station nearest to said portable transceiver;

control means operably connected to each of said logic circuits for sequentially enabling said logic circuits, one at a time, as said output signals in said event buffer means are circulated, and for generating timing control signals; and

memory means operably connected to said logic circuits for storing location data obtained therefrom;

said display means being responsive to said timing control signals from said control means and said location data from said memory means, thereby, displaying the location of said relay station nearest to said portable transceiver.

3,986,120

TELEPHONE SYSTEM COMPRISING A SATELLITE

Nils Herbert Edström, Bromma, and Bo Gustav Haglund, Trangsund, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

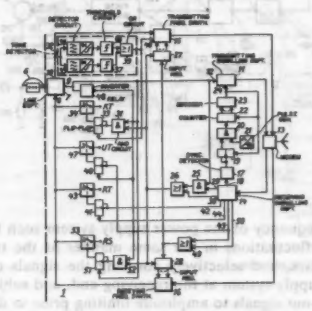
Filed Apr. 2, 1975, Ser. No. 564,313

Claims priority, application Sweden, Apr. 19, 1974, 7405279

Int. Cl.² H04J 5/00

U.S. Cl. 325—4 2 Claims

1. Telephone system comprising: a satellite arranged to relay a plurality of one-way signalling channels and one-way speech transmission channels, the latter being paired into two-way speech transmission channels; a plurality of earth stations, each of said earth stations comprising a plurality of line equipments each of which being connected to a subscriber and having an input for incoming speech signals, a first output for signals indicating the condition of the subscriber and a second output for outgoing speech signals and number information from the subscriber, a signalling equipment connected to said first output of said line equipments and arranged to transmit reports about the conditions of said subscribers and to receive commands about allocated calling and called sides of said two-way speech transmission channels to calling and called subscribers over said signalling channels, and a frequency synthesizer equipment connected to said input and said second output of said line equipments and arranged to connect said calling and called subscribers to their



allocated sides of said two-way speech transmission channels under control of said commands; and a central control station comprising a second signalling equipment arranged to receive said reports and transmit said commands, and a control equipment connected to said second signalling equipment and arranged to generate said commands and address them to said earth stations, said earth stations being divided into groups whose individual earth stations are permanently allocated a common first signalling frame and a respective time slot therein to transmit via first signalling channel among said signalling channels said reports to said central control station, and said central control station being allocated a second signalling frame comprising a synchronizing signal for said first signalling frame which is utilized exclusively by said central control station to make possible the transmission, via a second signalling channel among said signalling channels, said commands to said earth stations as soon as they are needed.

3,986,121

METHOD FOR REMOTE CONTROL THROUGH A POWER SUPPLY SYSTEM AND APPARATUS FOR CARRYING OUT THE SAME

Urs Oehrli, Zurich, Switzerland, assignor to Zellweger Uster Ltd., Uster, Switzerland

Filed May 13, 1974, Ser. No. 469,383

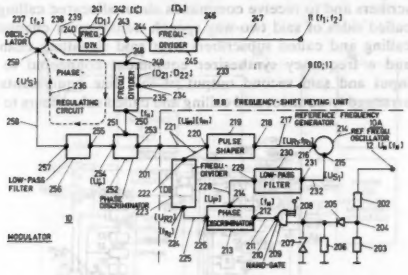
Claims priority, application Switzerland, May 18, 1973, 7118/73

Int. Cl.² H04B 1/00

U.S. Cl. 325—37 26 Claims

1. A method for remote-control through a power supply system and incorporating a transmitting end and a receiving end, comprising the steps of generating control commands signals, angle modulating said control commands signals upon a carrier, superimposing said control commands signal on the carrier at the transmitting end upon a power line of the power supply system, removing the angle-modulated control commands signals at any desired point of the power supply system, discriminating and evaluating such removed angle-modulated

control commands signals, maintaining the transmitter frequencies in a fixed relationship to the mains frequency of the power supply system and to thus follow its fluctuations, controlling the response frequency of a receiver at the receiving end for the control commands signals as a function of the



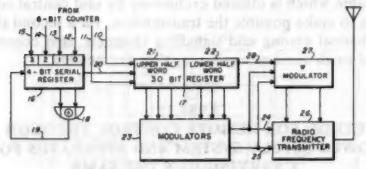
mains frequency of the power supply system such that it follows its fluctuations in the same manner as the transmitter frequencies, and selectively coupling the signals out of the power supply system at the receiving end, and subjecting the coupled-out signals to amplitude limiting prior to discrimination thereof according to their modulation.

3,986,122

RELIABLE COMMUNICATIONS SYSTEM

Robert P. McManus, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 22, 1962, Ser. No. 197,563
Int. Cl.² H04B 1/10
U.S. Cl. 325—42 **10 Claims**



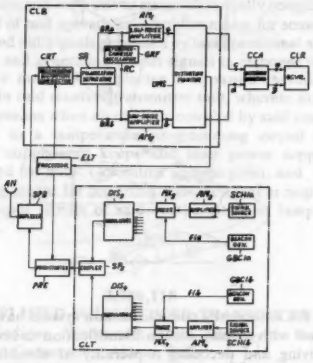
1. A communications transmitter system comprising; serial register means adapted to receive digital information for generating a digital word and having inputs and outputs; parallel register means operatively connected to the output of said serial register means for storing the output of said serial register; modulating means operatively connected to the output of said parallel register means for generating upper and a lower sidebands; each of said sidebands containing said digital word complementing means operatively connected to said modulating means for complementing one of said upper and lower sidebands; and radio frequency transmitter means operatively connected to the output of said complementing means and said modulating means for transmitting said upper sideband and lower sideband simultaneously.

3,986,123

SYSTEM FOR THE AUTOMATIC CORRECTION OF POLARIZATION DISTORTION IN MULTICHANNEL RADIOCOMMUNICATION STATION

Sebastiano Tirro, Rome; Roberto Cafissi, and Enzo Cavalieri d'Oro, both of Monza, all of Italy, assignors to Telespazio S.p.A. per le Comunicazioni Spaziali, Rome; GTE Telecomunicazioni S.p.A. and Societa Italiana Telecomunicazioni Siemens S.p.A., both of Milan, all of, Italy

Filed Sept. 3, 1975, Ser. No. 610,042
Claims priority, application Italy, Sept. 3, 1974, 26884/74
Int. Cl.² H04B 7/02
U.S. Cl. 325—56 **8 Claims**



1. A system for correcting polarization distortions in microwaves arriving from a remote post at a local station, said microwaves having a frequency band divided into a multiplicity of channels with two conjugate polarizations including a pair of central beacons respectively sent out with said polarizations by the remote post, comprising:

waveguide means for conducting a multichannel band of incoming microwaves with said two polarizations accompanied by said central beacons;

regenerative compensation means in said waveguide means for introducing corrective amplitude and phase distortions into the incoming band;

separator means downstream of said compensation means for divorcing said polarizations from each other;

monitoring means connected to said separating means for extracting said central beacons from said polarizations and deriving therefrom a set of output signals for the control of said compensation means;

demodulating means connected to said separator means for distributing incoming message signals from different channels of said band to respective pairs of transmission paths, each transmission path of a pair receiving signals arriving with a respective polarization; and

individual distortion-corrective means for each channel connected between the transmission paths of each pair for suppressing residual cross-talk components thereof in response to frequency coincidences between the paired transmission paths.

3,986,124

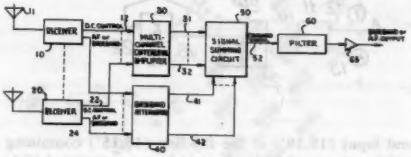
COMBINER FOR DIVERSITY RECEIVING SYSTEMS

Joseph H. Mitchell, Jr., Washington, D.C., assignor to Page Communications Engineers, Inc., Vienna, Va.

Filed Dec. 1, 1964, Ser. No. 415,135
Int. Cl.² H04B 1/06
U.S. Cl. 325—305 **18 Claims**

1. A diversity combiner for FM reception systems having a plurality of identical receivers each of which derives an input signal from a different antenna location and provides an audio

output signal derived from said input signal and a DC control signal inversely proportional to input noise level, said combiner comprising multiple channel differential amplifier means, multiple channel summing amplifier means coupled to said differential amplifier means, and means for applying said



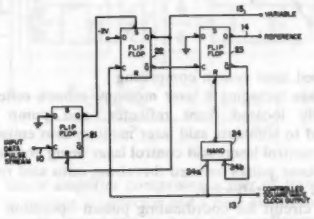
audio signals to separate channels of said summing amplifier means, said differential amplifier means responsive to said DC control signals to control the conductivity of said summing amplifier means for passage of said audio signals therethrough in respective inverse proportion to said noise levels.

3,986,125

PHASE DETECTOR HAVING A 360 LINEAR RANGE FOR PERIODIC AND APERIODIC INPUT PULSE STREAMS

Jules A. Eibner, Maple Glen, Pa., assignor to Sperry Univac Corporation, New York, N.Y.

Filed Oct. 31, 1975, Ser. No. 627,576
Int. Cl.² H03K *3/02*
U.S. Cl. 328—62 **12 Claims**



1. A phase detector responsive to an input pulse stream and a square wave clock signal for producing in response to each input pulse a reference pulse having a duration substantially equal to one-half the clock pulse period and a variable pulse having a duration which is greater or less than the reference pulse duration in accordance with the direction and amount of time displacement of the input pulse from the center of the clock pulse cycle in which said input pulse occurs, said phase detector comprising:

means responsive to an input pulse occurring in one cycle of the clock pulse signal for initiating a variable pulse,

means responsive to the leading edge of the clock pulse occurring in the next cycle of the clock pulse signal for terminating the variable pulse and initiating a reference pulse, and

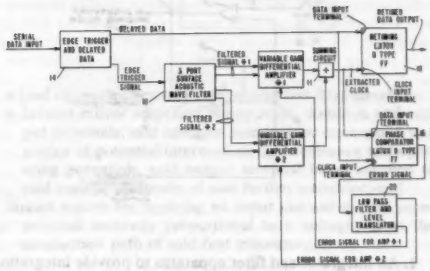
means responsive to the transition of the clock pulse immediately following said leading edge for terminating the reference pulse.

3,986,126

SERIAL PULSE-CODE-MODULATED RETIMING SYSTEM

Abraham M. Gindi, San Jose, Calif.; Ju-Hi J. Hong, and William K. Stelzenmuller, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 15, 1975, Ser. No. 577,570
Int. Cl.² H03K *1/17*; H04L *7/00*
U.S. Cl. 328—63 **10 Claims**



1. An improved clock retiming system for pulse-coded data comprising:

edge trigger and delayed data means for extracting clock signals from and delaying said encoded data;

filter means connected to said edge trigger and delayed data means for generating from said extracted clock signals first and second signals of the same amplitude nd frequency but of different phase;

first and second amplifying means connected to said filter means for amplifying said first and second signals, respectively, said first and second amplifying means each having the same variable gain characteristics;

summing means connected to said first and second amplifying means for summing said first and second amplified signals to produce a third signal having a phase which is a function of the relative amplitudes of said first and second amplified signals;

first sampling means connected to said summing means and said edge trigger and delayed data means for sampling said delayed pulse encoded data with said third signal to obtain the retimed encoded data;

second sampling and phase comparator means connected to said summing circuit and said edge trigger and delayed data means for sampling said third signal with said delayed pulse encoded data to obtain an error signal, the polarity of which indicates the relative phase of said third signal and said delayed pulse encoded data;

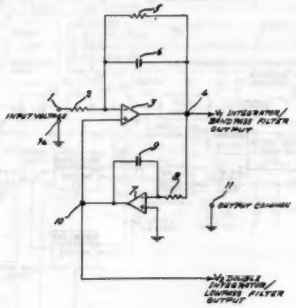
further filter and translating means connected to said second sampling and phase comparator means for filtering and translating said error signal into a pair of opposite phase error signals, one forming an input to said first amplifying means and the other forming an input to said second amplifying means to vary the respective variable gains thereof oppositely, thereby adjusting the phase of said third signal by means of said summing means to position said third signal to sample said encoded data.

3,986,127

INTEGRATED FEEDBACK ACTIVE FILTER/INTEGRATOR

David J. Ray, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 27, 1975, Ser. No. 581,176
Int. Cl.² G06G 7/18, 7/12
U.S. Cl. 328—128 3 Claims



1. An integrator and filter apparatus to provide integration, double integration and filtering comprising a first operational amplifier having first negative and first positive input terminals and a first output terminal, first and second signal input terminals, said second input terminal being grounded, a first resistor having the predetermined value of R_1, said first resistor interconnecting said first signal input terminal and said first negative input terminal, a parallel combination of a first capacitor and second resistor interconnecting said first output terminal and said first negative terminal, said first capacitor and said second resistor having a predetermined value of C_1 and R_4, respectively, said first output terminal providing an integrator output signal and a bandpass filter output, a second operational amplifier having second negative and positive terminals and a second output terminal, a third resistor interconnecting said first output terminal and said second negative terminal, said third resistor having a predetermined value of R_3, a second capacitor interconnecting said second negative terminal and said second output terminal, said second capacitor having a predetermined value of C_2, said first positive terminal connected to said second output terminal and providing a double integrator output signal and a low pass filter output in accordance with the relationship between capacitor and resistor value.

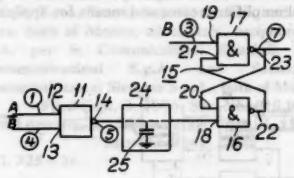
3,986,128

PHASE SELECTIVE DEVICE

Leif Eriksson, and Lennart Thornell, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Aug. 14, 1975, Ser. No. 604,713
Claims priority, application Sweden, Sept. 19, 1974, 7411769
Int. Cl.² H03D 13/00
U.S. Cl. 328—133 3 Claims

1. Device for determining the phase position between two signals (1,3), comprising at least one circuit which contains a gate (11,11') with at least two inputs (12,13;12',13') for said signals (1,2,3,4) and an output (14,14') for a first output signal (5,6) which is dependent on the phase position between the input signals, and a flip-flop (15,15') having a first input (19,19') for one of the input signals (3,4) or a complement signal thereof and a second input (18,18') for said first output signal (5,6), the connection between the gate (11,11') and the



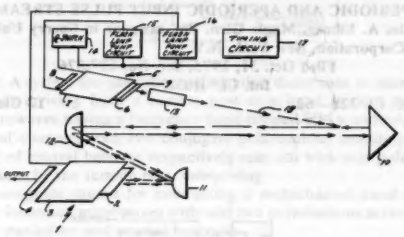
second input (18,18') of the flip-flop (15,15') containing a time delay circuit (24,24') for said first output signal (5,6).

3,986,129

GENERATION OF SUBMICROSECOND PULSES IN A LONG LASER

John A. Caffo; Alexander A. Abela; Theodore N. Ledbetter, and Darrell W. Joubert, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 25, 1972, Ser. No. 274,541
Int. Cl.² H01S 3/08, 3/11, 3/23
U.S. Cl. 330—4.3 5 Claims



1. A pulsed laser system comprising
a long laser including a laser medium, a back reflector, a remotely located front reflector, and pump means adapted to stimulate said laser medium into emission,
a pulsed control laser, said control laser being positioned to direct laser pulses emitted therefrom onto said remotely located front reflector,
a timing circuit for coordinating pulsed operation of said control laser and activation of said long laser pump means, and
an off-axis telescope disposed between said laser medium and said remotely located front reflector.

3,986,130

LASER APPARATUS

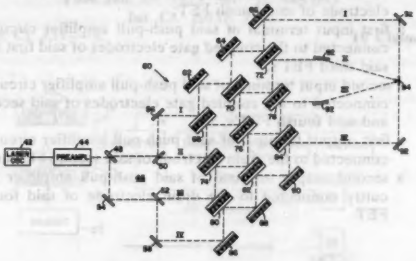
John Michael Soures, Pittsford, and John Frederick Hoose, Rochester, both of N.Y., assignors to University of Rochester, Rochester, N.Y.

Filed Oct. 9, 1974, Ser. No. 513,364
Int. Cl.² H01S 3/02, 3/00
U.S. Cl. 330—4.3 14 Claims

1. Laser amplifier apparatus which comprises
a. a source providing a laser light beam,
b. means for splitting said beam into a plurality of beams,
c. a multiplicity of face pumped laser amplifiers, a plurality of said amplifiers having a pair of planar bodies of laser material having their end faces opposed to each other, optical pumping means disposed between said opposed

end faces for simultaneously optically pumping said pair of bodies, and

d. said amplifiers being disposed in an array to provide a plurality of paths each for a separate one of said beams



along which each of said separate beams is reflected successively between the bodies of laser material in successive ones of said amplifiers whereby to amplify said plurality of beams for application to a target.

3,986,131

CLASS AB-DUAL PUSH-PULL AMPLIFIER

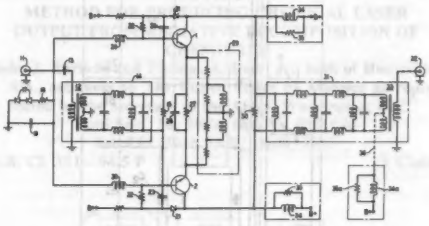
David Gene Ross, Red Bank, and Paul Schnitzler, Kendall Park, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 9, 1974, Ser. No. 530,813

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² H03F *3/26*

U.S. Cl. 330—15 **9 Claims**



1. A linear amplifier comprising a pair of transistors each having an emitter, a collector and a base electrode, means for connecting the transistors in push-pull configuration, means for biasing the transistors at or near collector saturation, and means for providing a constant current source for at least short durations.

3,986,132

SERIES ENERGIZED TRANSISTOR AMPLIFIER

Harold Allen Wittlinger, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 22, 1975, Ser. No. 624,897

Int. Cl.² H03F *3/42*

U.S. Cl. 330—18 **4 Claims**

1. In combination:

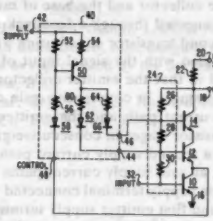
a first transistor and at least one further transistor, each having a conduction path and a control electrode, said conduction paths being connected in series between first and second terminals for conducting a load current therebetween;

means for applying a control signal to the control electrode of said first transistor for controlling the flow of said load current;

first bias means coupled to the control electrode of said further transistor for supplying a quiescent forward bias thereto;

means for applying a reference potential to said first terminal;

a third terminal for receiving a source of operating potential;



a load connected between said second and third terminals;

a current mirror amplifier having input, common and output terminals, said common terminal for connection to a source of potential intermediate said reference and operating potentials, said output terminal being coupled to said control electrode of said further transistor; and

circuit means for applying an input current to said input terminal inversely proportional to a voltage across the conduction path of said first transistor.

3,986,133

WIDE-BAND TRANSISTOR AMPLIFIER

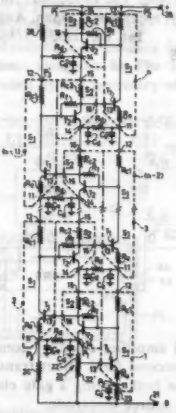
Engel Roza, and Peter Wilhelm Millenaar, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 5, 1975, Ser. No. 628,910

Claims priority, application Netherlands, Jan. 27, 1975, 7500898

Int. Cl.² H03F *3/42*

U.S. Cl. 330—18 **3 Claims**



1. A wide-band transistor amplifier whose total gain is distributed over a number of cascade-connected gain cells, each gain cell comprising a first current series-feedback transistor stage and a following second voltage shunt-feedback transistor stage, said first transistor stage being arranged as a common-emitter stage having an emitter-collector path between a first emitter supply terminal and a first collector supply terminal

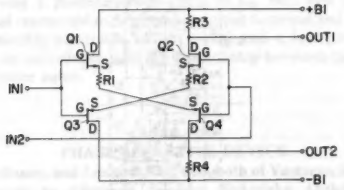
including an emitter resistor and a collector resistor, the base of said first transistor constituting a signal input of the gain cell, said second transistor stage also being arranged as a common-emitter stage having an emitter-collector path between a second emitter supply terminal and a second collector supply terminal including a collector resistor, the base of said second transistor being connected to the collector of said first transistor, the collector and the base of said second transistor being interconnected through a feedback resistor, the collector of said second transistor constituting a signal output of the gain cell coupled with the signal input of the next gain cell, characterized in that the emitter-collector paths of said second transistor stages in consecutive gain cells form part of a first supply current path and the emitter-collector paths of said first transistor stages in consecutive gain cells alternately form part of a second supply current path and a third supply current path, all said supply current paths being coupled with a first common supply terminal connected through resistors to said second and first emitter supply terminals of the first gain cell and to said first emitter supply terminal of the second gain cell, all said supply current paths also being coupled with a second common supply terminal connected directly to said first and second collector supply terminals of the last gain cell and connected through a resistor to said first collector supply terminal of the penultimate gain cell, said first supply current path further being coupled with said second and third supply current paths, through current distribution resistors connected between said second emitter supply terminal of a gain cell and said first emitter supply terminal of the next gain cell as well as between said second emitter supply terminal of the last gain cell and said first collector supply terminal of the penultimate gain cell, said first and second emitter supply terminals of all gain cells constituting contact points for connecting these terminals through capacitors to a point of reference potential, said signal input of the first gain cell being connected to a tap on said resistor connecting said second emitter supply terminal of this first gain cell to said first common supply terminal.

3,986,134

PUSH-PULL AMPLIFIER CIRCUITRY

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Aug. 15, 1975, Ser. No. 605,172
Claims priority, application Japan, Aug. 23, 1974, 49-96773
Int. Cl.² H03F *3/16*
U.S. Cl. 330—35 **7 Claims**



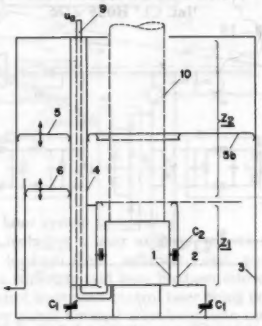
1. A push-pull amplifier circuitry comprising:
- a first and a second field effect transistor (FET) of an n-channel type both having a gate electrode, a drain electrode and a source electrode;
- a third FET of a p-channel type having a gate electrode and a source electrode connected to the gate electrode of said first FET and to the source electrode of said second FET, respectively, and having a drain electrode;
- a fourth FET of a p-channel type having a gate electrode and a source electrode connected to the gate electrode of said second FET and to the source electrode of said first FET, respectively, and having a drain electrode;
- a positive voltage supply connected to the drain electrode of said first FET and via a first resistor to the drain electrode of said second FET;
- a negative voltage supply connected to the drain electrode of said third FET and via a second resistor to the drain electrode of said fourth FET;
- a first input terminal of said push-pull amplifier circuitry connected to the coupled gate electrodes of said first and said third FET's;
- a second input terminal of said push-pull amplifier circuitry connected to the coupled gate electrodes of said second and said fourth FET's;
- a first output terminal of said push-pull amplifier circuitry connected to the drain electrode of said second FET and,
- a second output terminal of said push-pull amplifier circuitry connected to the drain electrode of said fourth FET.

3,986,135

ANODE ARRANGEMENT FOR THE OUTPUT POWER AMPLIFIER OF A SHORT-WAVE TRANSMITTER

Vladimir Milliquet, Wettingen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 22, 1975, Ser. No. 579,878
Claims priority, application Switzerland, May 28, 1974, 7287/74
Int. Cl.² H03F *3/60*
U.S. Cl. 330—56 **10 Claims**

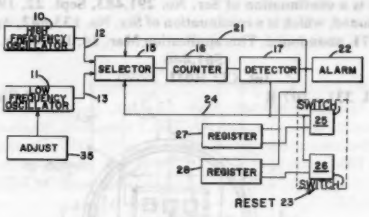


1. An anode arrangement for the final stage of a short-wave transmitter of the can type comprising:
- a transmitting tube having a central axis;
- a housing having a wall surrounding and coaxial with said transmitting tube axis;
- a first conductor within said housing surrounding and coaxial with said transmitting tube axis;
- a second conductor being arranged adjacent to said first conductor within the housing parallel to the transmitting tube axis;
- a first slide having portions extending between and connecting the second conductor and the housing wall, and being positionable between and connectable to the first conductor and the housing wall;
- an output collector, arranged within the housing parallel to said second conductor; and
- a second slide being connected between the second conductor and said output collector, said second slide for providing an output connection for said anode arrangement.

3,986,136
RANDOM INTERVAL GENERATORS AND METHOD OF BEHAVIOR MODIFICATION USING SAME

Russell T. Hurlburt, 22490 Edgecliff Drive, Euclid, Ohio 44123

Filed Jan. 29, 1975, Ser. No. 545,093
Int. Cl.² H03K 3/84
U.S. Cl. 331—78 10 Claims

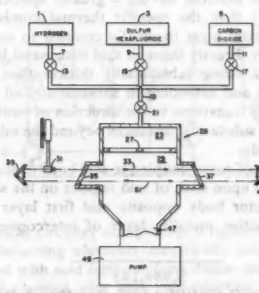


1. An operator resettable random interval generator, comprising:
   a. means for generating a time interval of random length;
   b. signal means connected to said generating means for producing an alerting signal at the conclusion of a generated random time interval;
   c. a pair of operator actuated reset means each connected for terminating said signal and initiating the next random time interval; and
   d. feedback means connected to said pair of reset means for providing distinctive feedback to the operator, according to which of the reset means was actuated.

3,986,137
METHOD FOR PRODUCING CHEMICAL LASER OUTPUT FROM RADIATIVE DECOMPOSITION OF CHEMICALS

John J. Ehrlich, and Thomas A. Barr, Jr., both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 30, 1974, Ser. No. 510,524
Int. Cl.² H01S 3/095, 3/08, 3/22
U.S. Cl. 331—94.5 P 1 Claim

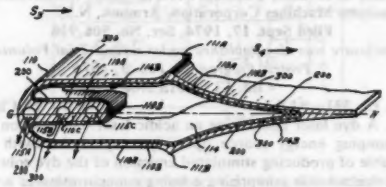


1. A method for providing a laser output comprising, mixing a plurality of non reactive chemicals consisting of hydrogen, sulfur hexafluoride and carbon dioxide in a mixing chamber, bringing said plurality of non reactive chemicals into a reaction chamber and continuously pumping said non reactive chemicals through said reaction chamber, initiating one of said non reactive chemicals to form a chemical species that is in a vibrationally excited state and active toward remaining non reactive chemicals, releasing energy from said formed chemical species with said remaining non reactive chemicals to make said non reactive chemicals laser active and cause lasing from said remaining non reactive chemicals to produce a laser output, and feeding a portion of said laser output back into the non reactive chemicals to provide sustained initiation of chemical reaction of the chemical species and thereby a continuous wave laser output.

3,986,138
ISOTHERMAL GAS DYNAMIC LASER NOZZLE

John W. Neal, North Palm Beach, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 29, 1974, Ser. No. 456,406
Int. Cl.² H01S 3/04, 3/095, 3/22
U.S. Cl. 331—94.5 P 2 Claims

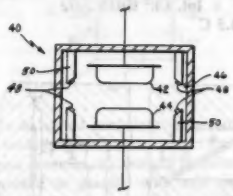


1. An isothermal gas dynamic laser nozzle comprising two identical hollow nozzle portions, with each said nozzle portion having a longitudinal axis, and an internal surface which has a sintered nickel fiber wick attached thereto that is saturated with a metal in a liquid state, and a void with a fore end and an aft end, with said aft end having a forwardly disposed protrusion in which a plurality of coolant flow passages are located and which said coolant flow passages are transversely positioned in relationship to said longitudinal axis, and with each said nozzle portion so dimensioned and so configurated that, when said two identical hollow portions are positioned in layered fashion, and in registration, and with their respective longitudinal axes in parallel, the nozzle is formed, limited and defined.

3,986,139
RADIOACTIVELY PREIONIZED ELECTRICAL DISCHARGE LASER

Clinton T. Meneely, Westford, and Howard Schlossberg, Lexington, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 18, 1975, Ser. No. 550,781
Int. Cl.² H01S 3/09, 3/22
U.S. Cl. 331—94.5 P 2 Claims



1. In a TEA laser having a supporting structure, an active medium located within said supporting structure, a pair of electrodes within said supporting structure forming a waveguide allowing for low loss propagation of laser radiation to be generated within said active medium between said pair of electrodes, and a discharge circuit, the improvement comprising a plurality of platforms mounted within said supporting structure and separated from at least two sidewalls thereof,

each of said platforms having a surface thereon for supporting a Beta particle emitter, each of said surfaces being beveled to face in the direction of said electrodes and the region therebetween at least one Beta particle emitter capable of ionizing atmospheric pressure laser gas being mounted on each of said inclined surfaces, the distance between said Beta particle emitters and said active medium between said electrodes being on the order of the mean Beta particle range or less and said electrodes being spaced no greater than the maximum Beta particle range apart from one another for providing a uniform preionization of said active medium within said waveguide by means of Beta particle emission.

3,986,140

2,4,6 TRISUBSTITUTED PYRIDINE DYE LASERS

Channabasappa S. Angadiyavar, Bombay, India, and Rangaswamy Srinivasan, Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

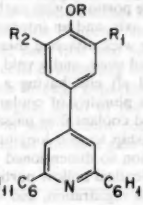
Filed Sept. 17, 1974, Ser. No. 506,916

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² H01S 3/00

U.S. Cl. 331—94.5 L **19 Claims**

1. A dye laser comprising an acidic laser dye solution and a pumping energy source operably coupled therewith and capable of producing stimulated emission of the dye solution, said dye solution comprising a lasing concentration in a non-interfering solvent, of a dye having the general structure as follows:



wherein R can be any alkyl group having from 1 to 6 C atoms; R_1 can be H, CH_3, C_2H_5, F, and OCH_3; R_2 can be H, CH_3, C_2H_5, F, or OCH_3; and R_1 can equal R_2.

3,986,141

GAS DISCHARGE LASER

Kornelis Bulthuis; Johannes Van der Wal, and Bram Johan Derksema, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

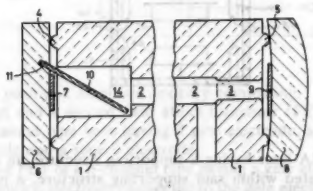
Filed Feb. 14, 1975, Ser. No. 549,931

Claims priority, application Netherlands, Feb. 28, 1974, 7402691

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² H01S 3/02

U.S. Cl. 331—94.5 C **4 Claims**



1. A gas discharge laser for generating stimulated emission, which comprises: a laser tube, first and second reflectors disposed at the ends of said laser tube, at least one of the said reflectors including means for passing a coherent beam, and a plane parallel transparent plate disposed with a normal thereto enclosing an angle with the axis of said laser tube equal to the Brewster angle, said plate being carried by the other of said reflectors.

3,986,142

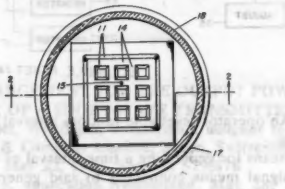
AVALANCHE SEMICONDUCTOR AMPLIFIER

Chung Kyu Kim, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 447,620, March 4, 1974, abandoned, which is a continuation of Ser. No. 291,483, Sept. 22, 1972, abandoned, which is a continuation of Ser. No. 133,642, April 13, 1971, abandoned. This application Mar. 24, 1975, Ser. No. 561,446

Int. Cl.² H01L 29/90

U.S. Cl. 331—107 R **7 Claims**



1. In combination:

a body of semiconductor material having a plurality of elongated regions for producing charge carrier multiplication, each of said elongated regions orthogonally intersecting other ones of said elongated regions;

a first layer of metal contacting said semiconductor material at a boundary of said regions and forming a unidirectionally conductive junction therewith:

the thickness of said first metal layer being substantially less than the thickness of said regions;

the width of said regions and said unidirectionally conductive junction extending in a direction substantially transverse to the average direction of motion of said carriers for a distance less than 10 times the thickness of said regions;

means for producing charge carrier multiplication in said regions comprising means for applying a voltage in a reverse direction across said junction and across said regions;

a heat sink of material having a greater specific thermal conductivity than the specific thermal conductivity of said first metal layer thermally coupled to said regions substantially directly through said first metal layer;

said heat sink being substantially thicker than said first metal layer and extending in substantially all directions substantially transverse to the direction of motion of said carriers for substantial distances beyond the edges of said regions; and

a second layer of metal coupled to said body of semiconductor material upon each of said regions on the side of said semiconductor body opposite said first layer of metal, said conductive metallic layer of interconnecting said regions.

3,986,143

SAWTOOTH GENERATOR HAVING A WIDE FREQUENCY VARIATION RANGE

Karl-Dieter Nutz, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Sept. 10, 1975, Ser. No. 611,973

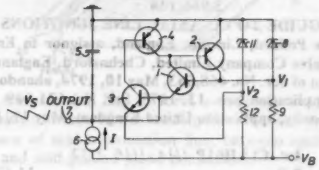
Claims priority, application Germany, Sept. 11, 1974, 2443406

Int. Cl.² H03K 3/26, 4/08

U.S. Cl. 331—111 **3 Claims**

1. In a sawtooth generator comprising a capacitor having one terminal connected to ground and its other terminal con-

nected to the output of a constant current source means for slowly charging said capacitor, and circuit means for rapidly discharging said capacitor including first and second mutually complementary transistors with said first transistor having its emitter connected to said other terminal of said capacitor and responsive to the voltage on the capacitor, its base connected to a first reference voltage and to the collector of said second transistor, and its base connected to the collector of said second transistor, and with said second transistor having its



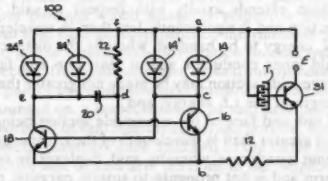
emitter connected to ground; the improvement wherein: said circuit means further includes third and fourth mutually complementary transistors; said third transistor is of the same polarity type as said first transistor and has its base connected to the emitter of said first transistor, its collector connected to the base of said fourth transistor and its emitter connected to a second reference voltage; and said fourth transistor has its collector connected to the collector of said first transistor and its emitter connected to ground, whereby the sawtooth generator has a wide frequency variation range.

3,986,144

OSCILLATOR WITH BLINKING LIGHT EMITTING DIODE FOR ORNAMENTAL RING

Joseph Russo, Hotel George Washington, 23 St. and Lexington Ave., New York, N.Y. 10010

Filed June 16, 1975, Ser. No. 587,251
Int. Cl.² F21V *33/00*; H05B *37/02*; A44C *9/00*
U.S. Cl. 331—111 **11 Claims**



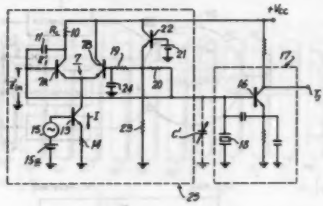
1. Electrical circuitry comprising: a light-emitting diode; a pair of gate-acting elements electrically coupled with one another and with said light-emitting diode; time delay means electrically coupled with said light-emitting diode and said gate-acting elements for rendering said gate-acting elements alternately conductive and non-conductive 180° out of phase with one another such that when one of said gate-acting elements is conductive the other is non-conductive, said light-emitting diode being electrically coupled with said gate-acting elements such that when one of said gate-acting elements is conductive the other is non-conductive and said light-emitting diode emits no light, and when said one of said gate-acting elements is non-conductive the other is conductive and said light-emitting diode emits light; and touch-sensitive switching means having no moving actuating parts and electrically coupled with said light-emitting diode for energizing the latter.

3,986,145

VARIABLE REACTANCE CIRCUIT INCLUDING DIFFERENTIALLY-CONNECTED TRANSISTOR DEVICE PROVIDING A VARIABLE REACTANCE INPUT IMPEDANCE

Masayuki Hongu, Komae, and Masahiro Tada, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 24, 1975, Ser. No. 589,903
Claims priority, application Japan, July 4, 1974, 49-76779
Int. Cl.² H03B *5/36*; H03C *3/14*; H03H *11/00*
U.S. Cl. 332—16 T **10 Claims**



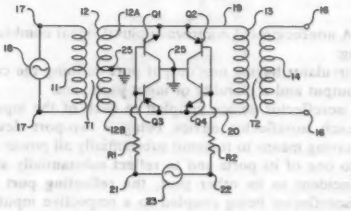
1. A variable reactance circuit comprising first and second transistors each having base, emitter and collector electrodes, said emitter electrodes of said first and second transistors being connected together, a a reactance element connected between said base electrode and said collector electrode of said first transistor, bias circuit means for applying a predetermined DC voltage to said base electrode of at least said second transistor, and a control signal source for applying a control signal to said connected together emitter electrodes of said first and second transistors so that the input impedance of said first transistor, as viewed from its base electrode, constitutes a variable reactance which varies in accordance with the level of said control signal.

3,986,146

DOUBLE BALANCED MODULATOR-DEMODULATOR

Mehr Ali Parkhideh, Palo Alto, and Claudio S. Mariotta, San Francisco, both of Calif., assignors to Farinon Electric, San Carlos, Calif.

Filed Sept. 25, 1975, Ser. No. 616,564
Int. Cl.² H03C *1/54*
U.S. Cl. 332—16 T **7 Claims**



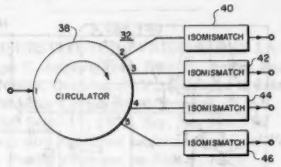
1. A double balanced modulator-demodulator comprising input means including an input transformer winding having first and second sections, an output transformer having one winding connected in parallel with said input transformer winding and having another winding coupled to the first to provide an output, two pairs of transistor switches, one pair connected between one common terminal of said transformers and ground and a second pair connected between the other common terminal of said transformer and ground, means for applying a carrier signal to the transistors of each pair to alternately switch each pair of said transistors on so that one of the two sections of said input winding are alternately connected to ground to short out said section to connect the other section in parallel with the output winding.

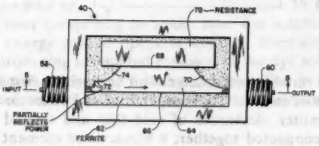
3,986,147

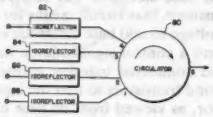
POWER DIVIDER AND POWER COMBINER UTILIZING ISOLATOR-MISMATCH AND ISOLATOR-REFLECTOR DEVICES

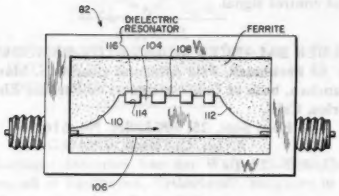
John L. Carter, Ocean, and Joseph McGowan, Spring Lake Heights, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 522,177, Nov. 8, 1974, Pat. No. 3,928,806.
This application Oct. 3, 1975, Ser. No. 619,287
Int. Cl.² H01P 1/36, 1/38, 5/12
U.S. Cl. 333—1.1 4 Claims









2. A nonreciprocal microwave plural signal combiner comprising:

a circulator having one output port defining the combiner output and a plurality of input ports, and

an isoreflector device coupled to each of the input ports, each isoreflector device being a two-port device and having means to transmit substantially all power incident to one of its ports and to reflect substantially all power incident to its other port, the reflecting port of each isoreflector being coupled to a respective input port of the circulator, said one port of each isoreflector defining the combiner input.

3. An isomismatch for use in the presence of a transverse intersecting d-c magnetic field comprising:

a metal plate having a rectangular recess surrounded by a perimeter wall,

the opposed narrower sides of the perimeter wall each having a perforation in line with each other,

an input and an output coaxial transmission line coupling nested in the two perforations,

a ferrite sheet overlaying the bottom surface of the rectangular recess,

a conductor strip on the ferrite sheet and extending end-to-end of the ferrite sheet and having two parallel rectilinear edges, one of which edges is substantially in line with the center conductors of the transmission line couplings and with its ends in electrical contact with the center conductors of the transmission line couplings, an impedance matching exponential taper between the two parallel edges at the end of the conductor strip adjacent the output transmission line coupling, the end of the conductor strip connected to the input transmission line coupling having a step followed by an impedance matching exponential taper for reflecting a predetermined fraction of incident microwave energy, and

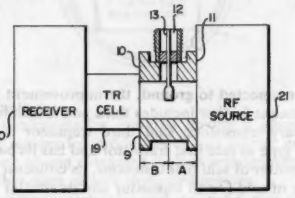
an energy attenuation strip on the ferrite and abutting the other edge of the conductor strip.

3,986,148

WAVEGUIDE TO CO-AXIAL LINE JUNCTIONS

John Francis Pollard, Lincoln, England, assignor to English Electric Valve Company Limited, Chelmsford, England

Continuation of Ser. No. 468,663, May 10, 1974, abandoned.
This application Nov. 13, 1975, Ser. No. 631,649
Claims priority, application United Kingdom, May 12, 1973, 22742/73
Int. Cl.² H01P 1/14, 1/16, 5/12
U.S. Cl. 333—7 R 11 Claims



6. A duplexer for enabling a transmitter and a receiver selectively to be coupled to an antenna, comprising in combination:

a straight waveguide section having opposite end faces adapted to be connected to an r.f. source and to a receiver respectively;

a transmission line intersecting said waveguide section between said opposite end faces and perpendicular to such waveguide section, said transmission line comprising an inner conductor and a hollow outer conductor communicating with the interior of said waveguide section, said inner conductor being coaxial with said outer conductor and projecting into the interior of said waveguide section and said outer conductor having an inner dimension which extends axially with respect to said waveguide section and is significantly less than ½ wavelength of the r.f. energy to be handled, whereby the distance between said inner conductor and at least one end face of said waveguide section may be made not greater than ¼ wavelength of the r.f. energy; and

said one end face of the waveguide section being disposed not greater than ¼ wavelength of the r.f. energy from said inner conductor whereby said duplexer is of compact form and is not propense to sustain parasitic modes.

3,986,149

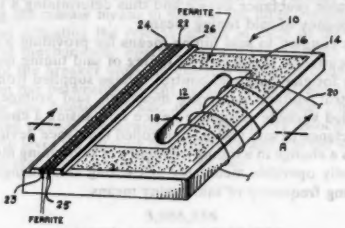
HIGH POWER RECIPROCAL CO-PLANAR WAVEGUIDE PHASE SHIFTER

Douglas H. Harris, Dayton, Ohio, and Fred J. Rosenbaum, Clayton, Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 29, 1975, Ser. No. 608,955
Int. Cl.² H01P 1/18
U.S. Cl. 333—31 R 4 Claims

1. A high power co-planar waveguide phase shifter comprising; a rectangular toroid of ferrite material; shell of substrate material encasing said ferrite along its outer surface; a block of substrate material filling the area within the toroid; an elongated ellipically shaped aperture in said block of substrate material parallel with one side of the toroid; a coil surrounding

one side of the toroid and passing through the aperture; a microstrip transmission line positioned on the surface of said ferrite; a plurality of ground plane conductors mounted on said ferrite and in a parallel, spaced apart relationship with



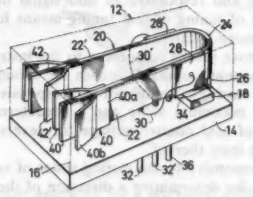
said transmission line to form a coplanar waveguide and a plurality of ferrite ribs extending from said ferrite toroid to the surface of said transmission line, between said transmission line and said ground plane conductors.

3,986,150

REED TYPE ELECTROMECHANICAL FILTER DEVICE

Toshiharu Tanaka, and Masao Akimoto, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 10, 1975, Ser. No. 557,027
Claims priority, application Japan, Mar. 13, 1974, 49-29314
Int. Cl.² H03H *9/04, 9/26, 9/32;* **H01L** *41/10*
U.S. Cl. 333—71 **19 Claims**



1. A reed type electromechanical filter device comprising: a vibrator element having a base portion, a pair of spaced parallel arm portions which merge at respective fixed ends thereof into said base portion disposed intermediate the arm portions to define a nodal axis of vibration thereat and which have respective free ends opposite to said intermediate base portion, a pair of electromechanical transducer elements each fixedly mounted on a respective one of said arm portions in the neighborhood of said intermediate base portion, and a pair of elastic metal members each attached to the outer side face of a respective one of said arm portions in the neighborhood of said free ends and elastically deformable in directions in which the arm portions are free to vibrate; and a housing enclosing therein said vibrator element, said transducer elements and said elastic metal members with said intermediate base portion of said vibrator element fixedly mounted on an inner face of the housing.

3,986,151

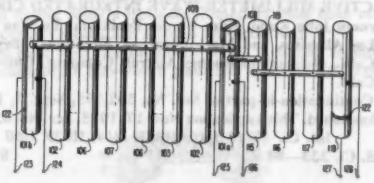
ELECTROMECHANICAL BRANCHING FILTER

Seiichiro Kanazawa, and Takeshi Yano, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed May 7, 1975, Ser. No. 575,548
Claims priority, application Japan, May 7, 1974, 49-49681
Int. Cl.² H03H *9/26, 9/32, 9/14;* **H01L** *41/08*
U.S. Cl. 333—71 **1 Claim**

1. An electromechanical branching filter comprising:

an input transducer;
a first plurality of resonators;
a first output transducer;
means mechanically interconnecting said input transducer, said first plurality of resonators and said first output transducer in a vibration transmitting relationship to form a first broad-bandwidth bandpass filter section;
at least one second resonator;
a second output transducer;
means mechanically interconnecting said at least one second resonator and said second output transducer in a vibration transmitting relationship to form a second narrow-bandwidth bandpass filter section, the bandwidth of said first bandpass filter section being more than ten times greater than that of said second bandpass filter, and the passbands of said first and second filter sections being adjacent each other so that said input transducer need not have a broad band frequency response; and



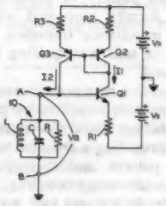
means mechanically interconnecting said at least one second resonator and said input transducer in a vibration transmitting relationship with a coupling coefficient in the range of ±30 percent of the geometric mean value of the fractional bandwidths of said first and second bandpass filter sections.

3,986,152

NEGATIVE IMPEDANCE NETWORK

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed June 16, 1975, Ser. No. 586,863
Int. Cl.² H03H *5/12*
U.S. Cl. 333—80 T **4 Claims**



1. A negative impedance network comprising, in combination:

A. a pair of input/output terminals;
B. a first transistor having a collector-emitter circuit and a base directly, DC connected to a first one of said terminals;
C. a current mirror connected to a supply bus and including second and third transistors,
1. said second transistor having a collector directly connected to said first transistor such that the collector current of said second transistor constitutes the current flowing through the collector-emitter circuit of said first transistor, and

2. said third transistor having a collector connected to supply its collector current to said first terminal,
3. the levels of collector currents of said second and third transistors being maintained in fixed ratio;

D. a voltage source connected to the second one of said terminals; and

E. impedance means connecting said collector-emitter circuit of said first transistor to said voltage source;

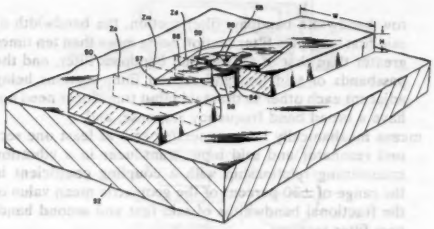
F. the impedance exhibited across said input/output terminals being a negative quantity determined by the impedance of said impedance means.

3,986,153

ACTIVE MILLIMETER-WAVE INTEGRATED CIRCUIT

Hiromu John Kuno, Palos Verdes Peninsula; Yu-Wen Chang, Los Alamitos, and Mario Siracusa, Fountain Valley, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 502,595, Sept. 3, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,613
Int. Cl.² H01P 3/16; H03B 7/14; H03F 3/60
U.S. Cl. 333—84 R 8 Claims



1. A millimeter wave integrated circuit comprising:

a. an image plane,

b. a layer of non-metallic waveguiding material formed atop said image plane and having a predetermined width and thickness and also having an opening therein exposing a predetermined area of said image plane,

c. a solid state device mounted within said opening of said waveguiding layer for coupling energy to or from said waveguiding layer,

d. a metallization pattern of predetermined geometrical configuration formed atop said waveguiding layer for providing an impedance transition region between remote regions of said waveguiding layer and said solid state device, and

e. DC bias connection means connected between said solid state device and said metallization pattern for both coupling energy between said device and said waveguiding layer and for providing a DC bias to said device via said metallization pattern and through said image plane, whereby efficient energy coupling is provided between said solid state device and said waveguiding layer, and said image plane provides excellent mechanical and thermal properties for said integrated circuit.

3,986,154

AUTOMATIC TUNING APPARATUS

Yasuhiro Yamada, Neyagawa; Kazuyoshi Tsukamoto, Hirakata; Yoshiaki Sakauchi, Tenri, and Kazufumi Ushijima, Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed July 10, 1975, Ser. No. 594,774
Claims priority, application Japan, July 18, 1974, 49-83080; Dec. 13, 1974, 49-143710
Int. Cl.² H03J 3/18
U.S. Cl. 334—15 19 Claims

1. An automatic tuning apparatus comprising;

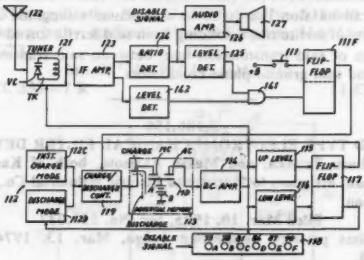
tuning means comprising a voltage controlled variable reactance device,

means for supplying a control voltage to said voltage controlled variable reactance device, said control voltage determining a reactance value of said voltage controlled variable reactance device and thus determining a tuning frequency of said tuning means,

means coupled to said tuning means for providing a signal indicative of the degree of tuning of said tuning means,

means for changing said control voltage supplied from said control voltage supplying means to said voltage controlled variable reactance device for causing a change in reactance of said voltage controlled reactance device and thus a change in a tuning frequency of said tuning means,

manually operable means for instructing said change in a tuning frequency of said tuning means,



first store means responsive to the instructing signal of said manually operable means for assuming one storing state thereof and responsive to said signal indicative of the degree of tuning of said tuning means for assuming the other storing state,

second store means responsive to the instructing signal of said manually operable means for assuming a predetermined storing state thereof and responsive to a predetermined maximum value and a predetermined minimum value of said control voltage for reversing the present storing state thereof,

means responsive to the storing states of said second store means for determining a direction of the change of said control voltage supplied from said control voltage supplying means, and

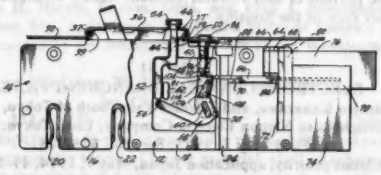
means responsive to said one storing state of said first store means for enabling said means for changing said control voltage supplied from said control voltage supplying means.

3,986,155

MODULAR MULTIPOLE CIRCUIT BREAKER WITH EXTERNAL TRIP CONTROL

Russell R. Kosup, Laguna Niguel, Calif., assignor to Unicorn Industries, Anaheim, Calif.

Filed Dec. 16, 1974, Ser. No. 532,938
Int. Cl.² H01H 75/02
U.S. Cl. 335—36 8 Claims



1. Multiple circuit breaker apparatus comprising a plurality of electric circuit breaker units, each breaker unit including a

nonconductive housing, an overload current responsive trip mechanism and release means for mechanically operating the trip mechanism to trip the breaker, the housing of adjacent breaker units having adjacent parallel walls in contact with each other; a trip bar extending through said parallel walls and linking the release means in each of the units, rotation of the trip bar actuating the release means in each of the breaker units to mechanically operate the trip mechanisms and trip each of the breaker units; an external trip lever connected to the trip bar between adjacent parallel walls of adjacent units outside the housing of said units; and external trip means mounted outside the housing and operatively associated with said trip lever for rotating the trip lever and trip bar to trip all the breaker units connected by the bar.

3,986,156

YOKE MOUNT ASSEMBLY

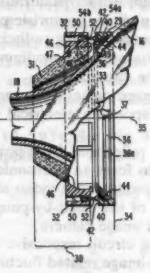
Bradford Knox Smith, Lititz, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 16, 1975, Ser. No. 541,517

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² H01F 7/00

U.S. Cl. 335—210 **10 Claims**



1. A yoke mount assembly for a television picture tube of the type having a magnetic deflection yoke in operational relationship with the tube, a platform positioned on the external surface of the tube, and a yoke combination which includes a housing which encloses at least a portion of the yoke, wherein the improvement comprises:

a plurality of rigid members disposed between and connecting said yoke combination and said platform, said connecting members permitting adjustment of the position of said yoke combination with respect to said platform, said adjustment including rotational translation of said yoke combination with respect to said platform, each of said connecting members having a pair of end portions shaped such that substantially constant physical contact is maintained between one of said end portions of said connecting member and said yoke combination and the other of said end portions and said platform while said yoke position is adjusted.

3,986,157

ELECTRIC FUSE HAVING SUBSTANTIALLY PRISMATIC CASING

Erwin Salzer, Waban, Mass., and Delbert L. George, Salem, N.H., assignors to The Chase-Shawmut Company, Newburyport, Mass.

Filed Oct. 16, 1975, Ser. No. 623,047

Int. Cl.² H01H 85/02

U.S. Cl. 337—186 **6 Claims**

1. An electric fuse comprising

a. fusible element means;

b. a granular arc-quenching filler embedding said fusible element means;

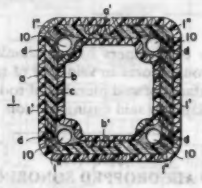
c. a tubular casing of electric insulating material housing said fusible element means and said filler, said casing being outwardly bounded by four substantially planar surfaces enclosing right angles and forming four externally rounded edge regions of increased wall thickness;

d. a pair of terminal plates conductively interconnected by said fusible element means, arranged at the ends of said casing and closing said casing;

e. four fasteners projecting through said pair of terminal plates into four fastener-shank-receiving recesses provided in said four edge regions of said casing;

f. said casing being a laminate formed by glass fiber reinforcement means and a cured synthetic resin;

g. said glass fiber reinforcement means including an intermediate ply of non-woven glass fiber mat material having



non-uniformly oriented fibers and said glass fiber reinforcement means further including an outermost ply and an innermost ply both of woven glass fiber cloth sandwiching said intermediate ply, said outermost ply and said innermost ply forming overlap regions coextensive with the length of said casing and recessed in said intermediate ply so that said casing has an even external surface and an even internal surface;

h. four bundles of substantially parallel glass fibers oriented substantially in a direction longitudinally of said casing, each arranged in one of said four edge regions thereof between said outermost ply and said innermost ply and each being sufficiently bulky to result in a substantial increase of the wall thickness of said casing at said four edge regions thereof; and

i. said four fastener-shank-receiving recesses being arranged in the regions of said casing occupied by said four bundles of glass fibers.

3,986,158

ELECTRIC FUSE HAVING CASING OF SYNTHETIC-RESIN-GLASS-CLOTH LAMINATE

Erwin Salzer, Waban, Mass., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed Sept. 18, 1975, Ser. No. 614,361

Int. Cl.² H01H 85/02

U.S. Cl. 337—246 **6 Claims**

1. An electric fuse including

a. fusible element means;

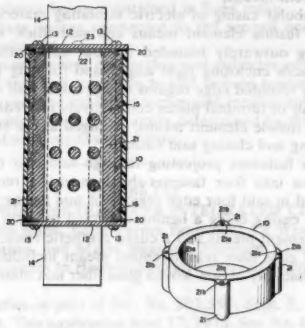
b. a body of granular arc-quenching filler embedding said fusible element means;

c. a tubular casing portion circular in cross-section having a wall of uniform thickness of a synthetic-resin-glass-cloth laminate, said casing portion housing said fusible element means and said arc-quenching filler;

d. a pair of terminal plates conductively interconnected by said fusible element means juxtaposed to the axially outer edges of said tubular casing portion and closing said tubular casing portion;

e. a plurality of rods of electric insulating material arranged parallel to the axis of said casing portion in abutting relation to the outer surface thereof, said plurality of rods

having substantially the same length as said casing portion and being angularly displaced relative to each other; and



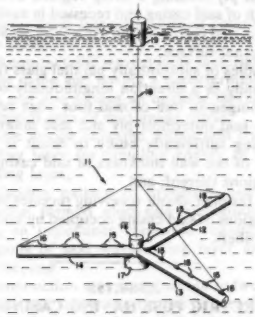
f. a plurality of fasteners having shanks projecting transversely through bores in said pair of terminal plates into the end surfaces of said plurality of rods, thus affixing said terminal plates to said casing portion.

3,986,159

AIR DROPPED SONOBUOY

George M. Horn, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 2, 1975, Ser. No. 609,267
Int. Cl.² B63B *21/52*
U.S. Cl. 340—2 **13 Claims**



1. A storage and erection system for a submarine structure comprising:

a cylindrical housing;

a removable end portion effectively held to said cylindrical housing to close one end thereof;

a piston slidably fitted within said cylindrical housing and effectively joined to said removable end portion such that movement of said piston causes removal thereof;

actuation means located within said cylindrical housing and positioned such that the piston is intermediate said removable end portion and said actuation means for moving of said piston;

fluid pressure means slidably held within said cylindrical housing and effectively connected to said removable end portion for removal therewith for providing a quantity of fluid under predetermined pressure; and

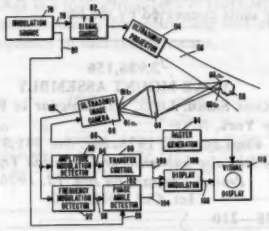
flexible conduit means attached to said fluid pressure means and folded to occupy the space within said cylindrical housing between said fluid pressure means and said piston for receiving said quantity of fluid and dimensioned to achieve structural rigidity when filled with said quantity of water at the predetermined pressure.

3,986,160

VISUALIZATION BY ULTRASONIC DETECTION

William R. Turner, Silver Spring, Md., assignor to Automation Industries, Inc., Silver Spring, Md.

Filed Apr. 10, 1975, Ser. No. 567,228
Int. Cl.² G01S *9/66*
U.S. Cl. 340—5 MP **20 Claims**



1. A system for ultrasonic visualization of objects immersed in a transmission medium, comprising:

an ultrasonic transmitter for radiating an ultrasonic beam through said transmission medium, said beam irradiating an object to be visualized;

an ultrasonic image camera for converting ultrasonic images to corresponding electrical signals on a point-by-point basis;

means focusing reflections from points on said object into said camera to form an ultrasonic image of said object, said camera producing a video signal which is a linear reproduction of the point-by-point interrogation of said image by said image camera;

a first processing circuit responsive to said video signal for reducing non-image related fluctuations in the amplitude of said video signal;

a second processing circuit responsive to said video signal for detecting relative time delays in said reflections from said object due to variations in depth dimensions of said object; and

display means including a display modulator for combining the outputs of said first and second processing circuits to provide a display signal, and a visual display unit responsive to said display signal for presenting amplitude and depth dimension information in a visual form.

3,986,161

UNDERWATER DIRECTIONAL GUIDANCE APPARATUS

John A. MacKellar, Portland, Oreg., assignor to Sea-Scan, Inc., Portland, Oreg.

Filed Apr. 7, 1975, Ser. No. 565,367
Int. Cl.² G01S *3/80*
U.S. Cl. 340—6 R **15 Claims**

1. Self-contained underwater guidance apparatus, comprising, in combination

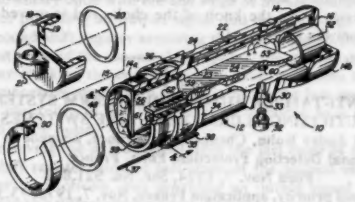
a water-tight, plastic housing including an elongate, tubular body having an open end and a closed end, and removable closure means for said body comprising a cap covering said open end and means forming a water-tight seal between said body and said cap,

transducer means secured within said housing adjacent the closed end of said body for interconverting acoustical energy and electrical energy,

electrical circuit means within said housing operatively connected to said transducer means, said circuit means including a magnetic field-actuatable switch,

a battery operatively connected to said switch for powering said circuit means,

a collar mounted on the exterior of said body and shiftable relative thereto, and



a magnet carried by said collar and shiftable therewith between first and second positions for the magnet, said magnet in one of its positions being sufficiently close to said switch for its field to actuate the switch, and in the other of its positions being spaced a sufficient distance from said switch to preclude such actuation.

3,986,162

SYSTEM FOR THE MULTIPLEXED TRANSMISSION OF SIGNALS FROM SEISMIC RECEIVERS

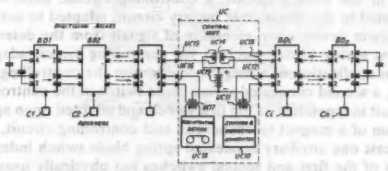
Roger Cholez, La Chapelle; Raymond Bonder, Orvault; Jean-Paul Ménard, Montfaucon, and Etienne Baudry, La Sequiniere, all of France, assignors to Societe d'Etudes, Recherches et Constructions Electroniques - SERCEL, Carquefou, France

Filed July 10, 1974, Ser. No. 487,189

Claims priority, application France, July 10, 1973, 73/25207

Int. Cl.² G01V *1/00*; H04J *3/12*

U.S. Cl. 340—15.5 TS **20 Claims**



11. A system for the multiplexed transmission of information signals from a plurality of sensors, including a transmission line extending outwardly from a generator of first pulse signals and returning to a recording station for the information signals, each sensor being coupled to the transmission line by means of a respective multiplexing circuit connected in series in the line, said first pulse signals comprising synchronization signals which precede said informarion signals in time, wherein

each sensor is adapted to supply information in a digital form, and

each multiplexing circuit includes:

at least one first shift register adapted to be filled with digital information and coupled in series in the transmission line in order to receive from the line upstream and transmit to the line downstream digital information in the form of successive coded pulses,

means for detecting the first pulse signals, coupled upstre- n of the transmission line.

means adapted to apply clock pulses to said first shift register after each detection of a first pulse signal to cause admission of data into said first shift register from the line upstream and delivery of previously stored data from said shift register into the line downstream of said multiplexing circuit, and

means for allowing the first pulse signals to pass through the multiplexing circuit from its upstream side to the line on its downstream side, before the starting of delivery of data by said first shift register on the line downstream.

3,986,163

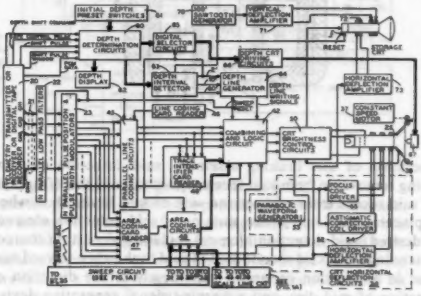
METHODS AND APPARATUS FOR RECORDING WELL LOGGING MEASUREMENTS

Jennings W. Elliott, West Redding, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 15,790, March 2, 1970, abandoned. This application Nov. 4, 1974, Ser. No. 520,956

Int. Cl.² G01V *1/40*

U.S. Cl. 340—15.5 DS **63 Claims**



1. In apparatus for recording well logging signals representative of at least one subsurface characteristic at various depth levels in a borehole, apparatus for writing depth lines, comprising:

a. means for producing depth signals representative of incremental changes in the depth levels of well logging signals to be recorded;

b. a recording medium;

c. means adapted for directing energy at selected positions on said recording medium;

d. means responsive to said depth signals for modulating the intensity of said energy to repetitively produce selected numbers of depth lines on said recording medium at preselected locations spaced at multiples of uniform selected intervals on the medium corresponding to said depth levels, the number of said depth lines produced on said recording medium at each preselected location being related to the distance between the preselected locations and being grouped at those preselected locations on the recording medium.

3,986,164

BRAKE ASSEMBLY WEAR DETECTOR

Akiyoshi Hirai; Masakazu Ishikawa; Sadayoshi Ito, all of Toyota, and Takeshi Noguchi, Itami, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Sumitomo Denki Kogyo K.K., both of, Japan

Filed Aug. 26, 1974, Ser. No. 500,681

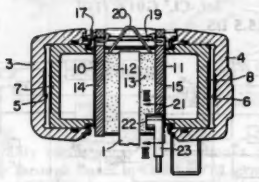
Claims priority, application Japan, Aug. 29, 1973, 48-100633[U]

Int. Cl.² B60T *17/22*; F16D *66/02*

U.S. Cl. 340—52 A **7 Claims**

1. A warning mechanism for detecting brake shoe wear in a wheel braking assembly including a brake shoe having a first side and a second side, a rotatable disc fixed relative to said wheel and positioned to be frictionally engaged by said first side of said brake shoe, piston means disposed to apply a braking force against said second side of said brake shoe and shim means interposed between said piston means and said

second side of said brake shoe, said warning mechanism comprising means defining a recess in said second side of said brake shoe at a part of said second side normally contacted by said piston, said recess extending from said second side partially through said brake shoe and terminating a distance from said first side, a defaceable detection element removable fitted in said recess and held in place by said piston means, said shim means extending over said detection element between said piston means and said detection element with the braking force applied by said piston means being directed to bear against said detection element in the direction toward said disc to hold said removably fitted detection element in place within said recess to prevent displacement thereof during



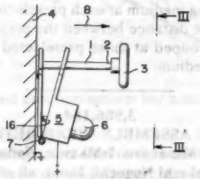
operation of said braking assembly, said detection element being removable from said recess by withdrawal therefrom out of said recess from said second side of said brake shoe when replacement of said brake shoe or of said detection element is desired, said detection element including a portion thereof extending from said second side of said brake shoe toward said disc in a direction generally transversely to the direction of rotation of said disc, and a warning signal generating device connected with said detection element and adapted to produce a warning signal indicating brake shoe wear when the first side of said brake shoe has been worn down by an amount sufficient to cause breakage of said detection element by contact of said detection element with said rotatable disc.

3,986,165

CHOKE POSITION INDICATING DEVICE

Robert W. MacIntyre, Belmont, Mass., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 4, 1976, Ser. No. 663,794
Int. Cl.² B60Q *1/00*
U.S. Cl. 340—52 D **1 Claim**



1. A choke position indicating device for indicating the position of a choke rod having a free end and a knob thereon extending from a dashboard of a motor vehicle, the choke rod being axially movable from a position in which the knob thereof is substantially next-adjacent the dashboard wherein the choke is open to a position in which said knob is spaced from the dashboard wherein the choke is closed, said choke position indicating device comprising

a signal device pivotally mounted on the dashboard and abutting the choke rod in a manner whereby when said choke rod is moved to close the choke it pivots the signal device away from the dashboard;

a source of electrical energy; and

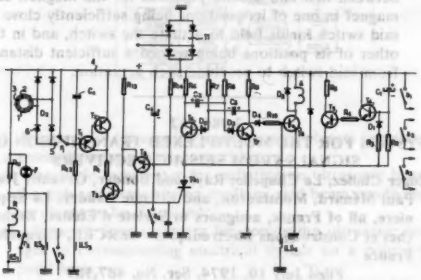
circuit means including electrical contact means and electrically connecting the source of electrical energy and the contact means in circuit, said contact means cooperating to maintain the circuit open and the signal device inoperative when the knob of the choke rod is next-adjacent the dashboard and to close the circuit and actuate the signal device when the knob of the choke rod is moved away from the dashboard.

3,986,166

ANTI-TAMPER AUTOMOBILE ALARM SYSTEM UTILIZING PLURAL REED TYPE SWITCHES

Michel Andre Kohn, Chennevieres, France, assignor to International Detection Protection, Paris, France

Filed Nov. 7, 1974, Ser. No. 521,852
Claims priority, application France, Nov. 7, 1973, 73.39569
Int. Cl.² B60R *25/10*
U.S. Cl. 340—63 **6 Claims**



1. An alarm system chiefly for use on automobile vehicles having an ignition coil and battery circuit, comprising a signal-producing detector sensitive to variation in the current intensity in the battery circuit, a controlling circuit, inductively coupled to the automobile battery circuit, adapted to actuate an alarm device upon reception of signals from the detector, a first spring blade switch in the controlling circuit adapted upon application of a magnet to energize the controlling circuit, a second concealed spring blade switch in the controlling circuit independent of the first switch and adapted upon application of a magnet to deenergize said controlling circuit, and at least one auxiliary concealed spring blade switch independent of the first and second switches but physically near the second switch and adapted upon application of a magnet to actuate said alarm device.

3,986,167

COMMUNICATION APPARATUS FOR COMMUNICATING BETWEEN A FIRST AND A SECOND OBJECT

John C. Paul, Mountain View, Calif., assignor to Hoffman Information Identification Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 221,712, Jan. 28, 1972, Pat. No. 3,839,717. This application Apr. 19, 1974, Ser. No. 462,247
Int. Cl.² G06F *11/08*
U.S. Cl. 340—146.1 BA **1 Claim**

1. Apparatus for providing an output signal having a binary code of length p bits cyclically encoded therein, comprising:

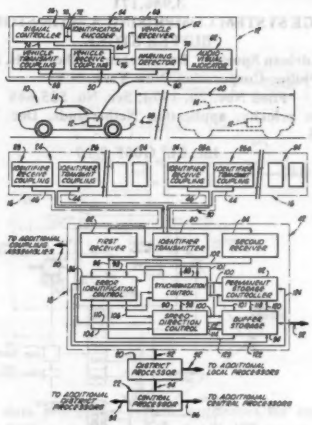
a clock providing clock pulses;

a first shift register receiving the clock pulses, the first shift register having P digital shift register stages containing the code bits of the binary code with the last stage of the first shift register providing an output signal having the binary code encoded therein and the first stage of the first shift register receiving the output signal from the last

stage of the first shift register, the first shift register clocking the code bit within each stage into the next successive stage with the code bit in the last stage being clocked into the first stage in response to a received clock pulse;

a second shift register receiving the clock pulses, the second shift register having P digital shift register stages containing the binary code with the last stage of the second shift register providing an output signal and the first stage of the second shift register receiving the output signal from the last stage of the second shift register, the second shift register clocking the code bit within each stage into the next successive stage, with the code bit in the last stage being clocked into the first stage, in response to a received clock pulse;

a gate receiving the output signal from the last stage of the first shift register and the last stage of the second shift register, respectively, and providing an output signal in response to a difference between the signal received from the last stage of the first shift register and the signal received from the last stage of the second shift register indicating a malfunction of one of the first and second shift registers; and



means for determining the repeatability of the binary code encoded in the output signal provided by the last stage of the first shift register comprising:

a channel shift register receiving the encoded signal and the clock pulses, the channel shift register having (P + 1) digital shift register stages and at least the first and last stages of the channel shift register providing output signals corresponding to the code bits therein, the channel shift register clocking each successive code bit of the encoded signal into the first stage and clocking the code bit within each stage into the next successive stage in response to a received clock pulse;

a gate receiving the output signals from the first and last digital shift register stages and providing a reset signal in response to a difference between the signal received from the first digital shift register stage and the signal received from the last digital shift register stage; and,

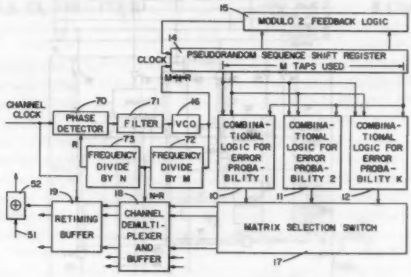
an R-pulse counter receiving the clock pulses and the reset signal, the R-pulse counter counting the clock pulses and producing an output signal indicative of the repeatability of the binary code in response to counting R clock pulses, where R is a predetermined integer multiple of P, the R-pulse counter being reset in response to a received reset signal.

3,986,168

MULTICHANNEL ERROR SIGNAL GENERATOR

Alfred T. Anderson, St. Petersburg, Fla., assignor to NCR Corporation, Dayton, Ohio

Filed June 2, 1975, Ser. No. 580,261
Int. Cl.² H04B *3/46*; G08C *25/00*
U.S. Cl. 340—146.1 AX **6 Claims**



1. A digital error signal generator comprising,

means for producing a primary pseudorandom bit sequence;

logic means for periodically receiving different selected bits from said primary pseudorandom bit sequence, said logic means comprised of a multiplicity of logic circuits for producing a multiplicity of secondary pseudorandom bit sequences, each of said secondary sequences having a different predetermined density;

a multiplicity of output error channels;

means connected to said logic means for sequentially transmitting secondary pseudorandom bit sequences on to said channels; and

means connected to said channels for delaying the transmitted bits in said channels until each channel has received a bit.

3,986,169

DEVICE PROTECTION METHOD AND APPARATUS

Yoshiki Kobayashi; Tadaaki Bandoh; Jushi Ide, all of Hitachi, and Toshiro Kamiuchi, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

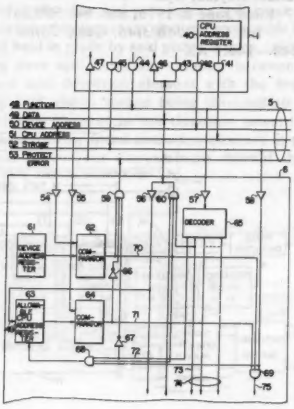
Filed May 30, 1975, Ser. No. 582,147
Claims priority, application Japan, June 3, 1974, 49-61880
Int. Cl.² G08B *29/00*
U.S. Cl. 340—146.1 C **4 Claims**

1. In a data transmission system in which a plurality of devices are coupled to a bus for data transfer among said devices, each of said devices having its own device address to identify itself and including address means for producing onto said bus a destination address signal indicating a device address to be accessed for data transfer and a source address signal indicating its own device address, each of said devices being enabled to effect data transfer only when there is coincidence between the device address indicated by a destination address signal which is produced onto said bus and its own device address, the improvement comprising a device protection system including:

first means for storing at least one preset enabled address combination of said devices, each two devices corresponding to each of said preset enabled address combinations being capable of effecting data transfer therebetween; and

second means for determining whether a combination of two devices according to the destination address and source address signals on said bus corresponds to said at least one preset enabled address combination of said first

means and for applying a protect error signal to the accessing device through such bus when said combination

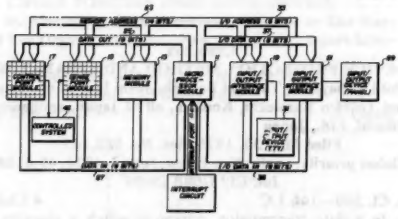


on said bus is not a preset enabled address combination of said first means.

3,986,170
MODULAR CONTROL SYSTEM DESIGN WITH MICROPROCESSORS

John G. Valassis, Elmwood Park; James R. Holden, Chicago, both of Ill., and Madhukumar A. Mehta, Gujrat, India, assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 30, 1974, Ser. No. 474,570
Int. Cl.[2] G06F 9/18
U.S. Cl. 340—172.5 **12 Claims**



1. An expandable modular control system for controlling a second system in response to data gathered from said second system and processed in accordance with instructions arranged as a control program, comprising:

modular memory means for storing said gathered data and said instructions at particular memory addresses therein;

modular microprocessor means for processing said gathered data in accordance with said control program and for generating control data for controlling said second system;

memory bus means intercoupling said modular memory means and said modular microprocessor means including a memory address bus and a data transfer bus;

means connected to said memory bus means for gathering data from said second system including a sense point module comprising a first array of memory devices for storing said gathered data and arranged as memory words each having a first unique memory address associated therewith, said sense point module being connected to said data transfer bus for transmitting said gathered data to the modular microprocessor means for processing in response to the modular microprocessor means transmitting said first unique memory addresses on said memory address bus;

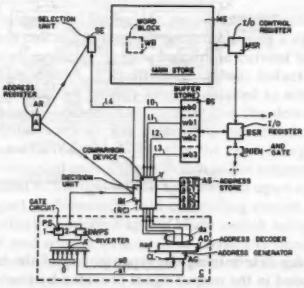
means connected to said memory bus means for controlling said second system including a control point module comprising a second array of memory devices arranged as memory words each having a second unique memory address associated therewith, said control point module being connected to said data transfer bus for receiving and storing control data transmitted by the modular microprocessor means in response to said modular microprocessor means transmitting said second unique memory addresses on said memory address bus;

gated interrupt means for receiving and storing interrupts and for selectively gating to said modular microprocessor means an interrupt memory address corresponding to a beginning address of a subroutine stored in said modular memory means in response to said modular microprocessor means receiving a gate interrupt instruction after said gated interrupt means receives at least one of said interrupts.

3,986,171
STORAGE SYSTEM COMPRISING A MAIN STORE AND A BUFFER STORE

Gerrit Adriaan Spoelder, Beekbergen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 20, 1974, Ser. No. 525,649
Claims priority, application Netherlands, Dec. 21, 1973, 7317545
Int. Cl.[2] G06F 9/10
U.S. Cl. 340—172.5 **3 Claims**



1. A data processing system including a processor and a storage configuration including a first store and a relatively faster second store, wherein data is organized in each of said stores in at least one data class and wherein each data class is composed of at least one word block having a predetermined number of words of data, each word having a plurality of word portions, the number of words in said second store being less than the number of words in said first store, comprising

means for supplying from said processor a predetermined word block address a predetermined word block for addressing individual word blocks within said first and second store;

means for storing said predetermined word block address;

address store address store means for storing addresses of word blocks stored in said second store;

comparison means for comparing said stored predetermined word blocks address with said addresses stored in said third means, and for producing a selecting signal if said stored predetermined word block address does not correspond with said addresses stored in said third means;

selection means responsive to said selecting signal for effecting a transfer of said predetermined word block from said first store to said second store;

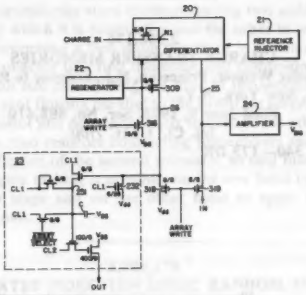
transfer means responsive to said selecting signal for effecting a transfer of said predetermined word block address from said second means to said address store means; and activating means for modifying the mode of addressing said second store;

address generator means responsive to said activating means, for generating successive addresses of word blocks in said second store and loading these addresses in said address store means for addressing said second store.

3,986,172
CCD REGISTER INTERFACE WITH PARTIAL-WRITE MODE

Ben R. Elmer, Glendale, and Wallace E. Tchon, Phoenix, both of Ariz., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed June 30, 1975, Ser. No. 591,723
Int. Cl.² G06F *13/00*; H03K *5/00*
U.S. Cl. 340—172.5 **7 Claims**



1. In a data processing system, apparatus for interfacing between a CCD register system and said data processing system, said apparatus comprising:

reference means for generating a reference charge;

differentiator means coupled to a CCD register and to said reference means for comparing packets of charge to said reference charge, said differentiator means generating a first signal proportional to one of said packets of charge;

data busing means for transmitting logic signals to and from said apparatus and said data processing system;

first amplifier means controllably coupled to said differentiator means for amplifying said first signal, and to said data busing means for amplifying said logic signals;

second amplifier means controllably coupling said differentiator means to said data busing means;

first means for receiving a signal corresponding to a WRITE mode of operation;

second means for receiving a signal indicating selection of said CCD register;

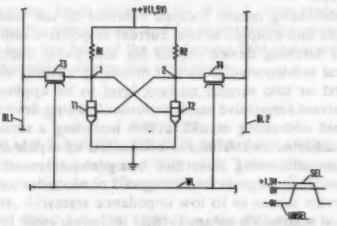
third means responsive to said first means for inhibiting the operation of said differentiator means, said third means also inhibiting the coupling of said first and said second amplifier means to said differentiator means and enabling the coupling of said first amplifier means to said data busing means; and

fourth means responsive to said second means for inhibiting said coupling of said data busing means to said second amplifier means.

3,986,173
MEMORY CIRCUIT

Utz Baitinger, Stuttgart; Knut K. Najmann, Gaertringen, and Werner Haug, Boeblingen, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 8, 1975, Ser. No. 620,690
Claims priority, application Germany, Dec. 19, 1974, 2460150
Int. Cl.² G11C *11/40, 13/00*
U.S. Cl. 340—173 R **8 Claims**



6. A semiconductor integrated circuit comprising,

a body of semiconductor material,

isolation means electrically separating said body into electrically distinct regions,

a base, an emitter and a collector diffusion in each of said regions to form a bipolar transistor in each of said regions,

conductive means interconnecting the base and collector contacts in one of said regions to the collector and base contacts respectively in the order of said regions to form cross coupled bipolar transistors,

conductive means interconnecting each of said emitter diffusions,

a source and a drain diffusion forming a source drain circuit with a conductive channel therebetween in each of said regions,

said collector in each region being connected to one end of the source drain circuit in the same region,

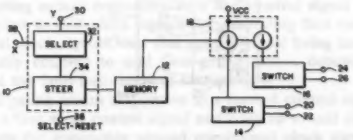
a metallic contact lying between each of said source and drain diffusions and forming a Schottky barrier with said body, and

means for biasing each of said metallic contacts to control the channels lying between said source and said drain diffusions.

3,986,174
COMMUNICATION SWITCHING SYSTEM

Leo L. Wisseman, and Anthony G. Bryan, both of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed May 2, 1974, Ser. No. 466,117
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **11 Claims**



1. An integrated circuit for connecting at least one communication line means to another communication line means comprising:

a. a first semiconductor switch means having a first impedance state corresponding to a disconnected mode and a

second impedance state corresponding to a connect mode and constituting a transmission path between the at least one communication line means and the another communication line means;

b. a current responsive semiconductor latching device means located external to the transmission path and coupled to said first semiconductor switch means and having a high impedance state for setting said first semiconductor switch means to said first impedance state at or below a first current level, and having a low impedance state for setting said first semiconductor switch means to said second impedance state at or above a second current level;

c. addressing means located external to the transmission path and coupled to said current responsive semiconductor latching device means for selectively enabling said first semiconductor switch means by causing either said first or said second current level to be applied to said current responsive semiconductor latching device means;

d. said addressing means further including a second semiconductor switch means connected to a pair of coordinate addressing lines and being responsive to applied coordinate signals for setting said semiconductor latching device means to its low impedance state;

e. said addressing means further including reset line means adapted to receive a reset control signal and being coupled to said second semiconductor switch means;

f. said second semiconductor switch means and said reset line means being responsive to the applied coordinate signals and the reset control signal for setting said current responsive semiconductor latching device means to its high impedance state;

g. said current responsive semiconductor latching device means comprising a three terminal device, and said first semiconductor switch means comprising a three terminal device; and

h. said reset line means including a third semiconductor switch means and an interconnected reset line, and being coupled to said semiconductor latching means and to said second semiconductor switch means for providing a conductive path from said second semiconductor switch means to said reset line in response to the application of coordinate and reset signals for setting said current responsive semiconductor latching device means to its high impedance state.

3,986,175

LIGHT OPTIC DATA HANDLING SYSTEM

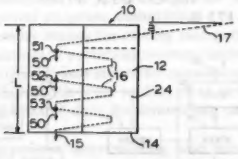
Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif. 92041

Filed Apr. 10, 1975, Ser. No. 566,916

The portion of the term of this patent subsequent to Mar. 18, 1992, has been disclaimed.

Int. Cl.² G11C *11/42, 13/04*

U.S. Cl. 340—173 LT **7 Claims**



1. A light optic data handling system, comprising:

a. A source of light and means for directing light therefrom along a primary optical path while undergoing a series of reflections within said system and to establish an availability of light from said source at a plurality of predetermined light output positions in said system for an electrically controlled redirecting of light along a selected one of a plurality of secondary optical paths stemming from said positions;

b. said means including an array of light reflecting interfaces of first and second light conducting media, each said interface presenting a length dimension;

c. said interfaces each angularly oriented so as to establish an optical relationship one with respect to the other and the path of light from said source for providing a series of 360° primary optical paths for said light, each said 360° path displaced one with respect to the other in a side-by-side relationship in the direction of said length dimension;

d. a plurality of light reflection control means each including electro-optical material and an interdigital array of first and second light transparent electrodes intimately joined to the surface thereof having means for extending the influence of an electrical potential thereto, said control means supported in an optical light reflection control relationship with said primary optical paths at each of said light output positions in the system for controlling the passage of light to a selected one of the secondary optical paths upon the extending of said influence to a corresponding one of said control means and thereupon establishing a spatially varying change in the index of refraction in said electro-optical material.

3,986,176

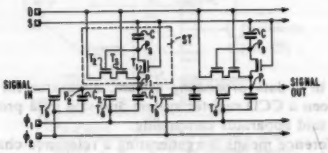
CHARGE TRANSFER MEMORIES

Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 9, 1975, Ser. No. 585,410

Int. Cl.² G11C *7/00*

U.S. Cl. 340—173 DR **21 Claims**



1. A charge transfer storage circuit comprising, in combination:

a charge transfer stage which includes a node at which charge may be stored;

a storage element;

means operative during one time interval for transferring charge from said node to said storage element,

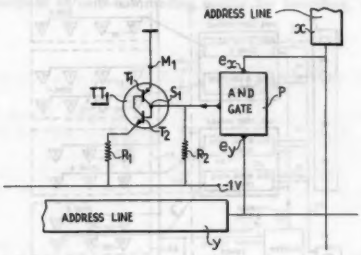
charge conducting means; and

means operative during a following time interval for transferring charge between said charge conducting means and said node under control of the charge in said storage element, said means for transferring comprising a transistor having a conduction path and a control electrode for controlling the conductivity of said path, said path being connected between said charge conducting means and said node, and said storage element being connected to said control electrode.

3,986,177
SEMICONDUCTOR STORE ELEMENT AND STORES FORMED BY MATRICES OF SUCH ELEMENTS

Jean-Edgar Picquendar, and Pham Ngu Tung, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 16, 1975, Ser. No. 623,080
Claims priority, application France, Oct. 18, 1974, 74.35144
Int. Cl.² G11C 11/40
U.S. Cl. 340—173 R 5 Claims

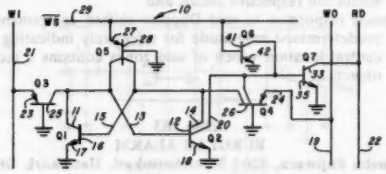


1. A semiconductor store element, having two stable states, one state in which it is conductive and the other in which it is blocked, comprising a first pnpn structure, a common region being the collector to a first transistor and comprising a zone of very small size constituting the base of the second transistor, the current flowing parallel to the substrate surface in one of the transistor and perpendicularly thereto in the other, a d.c bias source, two resistors connecting respectively said region and the collector of the second transistor to said bias source, a two-way gate making it possible, on the one hand to address said trigger stage and on the other hand to apply to it the write-in signals.

3,986,178
INTEGRATED INJECTION LOGIC RANDOM ACCESS MEMORY

David J. McElroy, and Wiley P. Snuggs, both of Houston, Tex., assignors to Texas Instruments, Dallas, Tex.

Filed July 28, 1975, Ser. No. 599,578
Int. Cl.² G11C 11/40
U.S. Cl. 340—173 R 19 Claims



1. A semiconductor memory cell formed on a common emitter region of one polarity semiconductor material having a memory access control circuit for providing a first voltage arbitrarily designated as a binary 1 and a second voltage arbitrarily designated as a binary 0 to provide a holding mode, a write mode, and a read mode, and having first and second vertical transistors of one polarity type, their emitters being integral with the common emitter region, electrically connected to form a latch circuit for setting the latch circuit in an arbitrarily designated 0 state by injecting current into the base of the first vertical transistor causing it to conduct and causing the second vertical transistor to be cut off and for setting the latch circuit in an arbitrarily designated 1 state by injecting current into the base of the second vertical transistor causing it to conduct and causing the first vertical transistor to be cut off, comprising:

a. holding injection circuit means connected to the control circuit and the latch circuit for maintaining current injection into the base of the conducting first or second transistor during the holding mode;

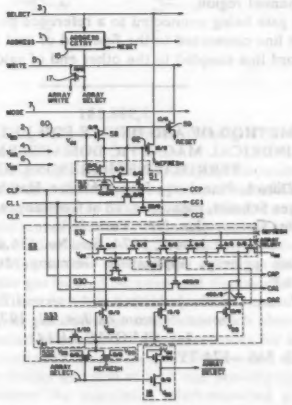
b. read-out means operatively connected to the control circuit and connected to the latch circuit for providing an indication of the binary state of the latch circuit; and

c. write and read injection circuit means connected to the control circuit for selectively injecting current into the base of the conducting first or second vertical transistor to set the latch circuit in the 0 or 1 state respectively during the write mode, and for maintaining current injection into the base of the conducting first or second vertical transistor during the read mode.

3,986,179
FAULT-TOLERANT CCD MEMORY CHIP

Ben R. Elmer, Glendale, and Wallace E. Tchon, Phoenix, both of Ariz., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed June 30, 1975, Ser. No. 591,666
Int. Cl.² G11C 11/34
U.S. Cl. 340—173 BB 22 Claims



1. Control circuitry responsive to control, address and clock signals for enabling operation of an array comprised of a plurality of storage registers operated in parallel, said circuitry comprising:

first gating means responsive to a first control signal and coupled to said clock signals for generating first conditional clock signals, said first control signal being conditionally coupled to said first gating means dependent upon the fault-free status of said array;

second gating means responsive to a second control signal and a first array control signal and coupled to said clock signals for generating second conditional clock signals; and

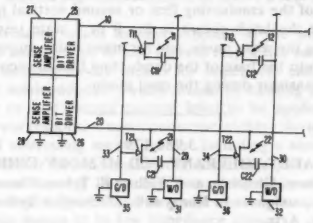
address circuitry responsive to said address signals for generating said first array control signal and a second array control signal, said first array control signal indicating selection of said array, said second array control signal indicating operation of said array in a WRITE mode.

3,986,180

DEPLETION MODE FIELD EFFECT TRANSISTOR MEMORY SYSTEM

Paul Edmand Cade, Milton, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 22, 1975, Ser. No. 615,262
Int. Cl.[2] G11C *11/24, 11/40*
U.S. Cl. 340—173 CA 12 Claims



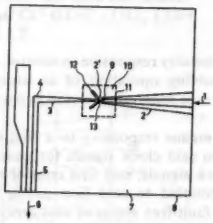
1. A memory system comprising,
intersecting word and bit lines,
semiconductor memory cells coupling said word lines and said bit lines,
each memory cell comprising,
a junction field effect transistor having a channel region having first and second ends and a gate surrounding said channel region,
said gate being connected to a reference potential,
a bit line connected to the first end of said channel, and
a word line coupled to the other end of said channel.

3,986,181

METHOD OF AND DEVICE FOR DETECTING CYLINDRICAL MAGNETIC DOMAINS BY MEANS OF FERRIMAGNETIC RESONANCE

Horst Dötsch, Pinneberg; Jürgen Müller, Hamburg, and Hans-Jürgen Schmitt, Pinneberg, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 5, 1974, Ser. No. 476,681
Claims priority, application Germany, June 18, 1973, 2330963
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.[2] G11C *11/14*
U.S. Cl. 340—174 TF 6 Claims



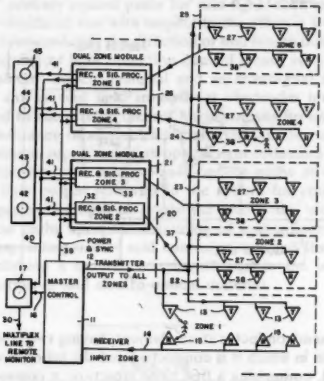
1. A device for detecting movable cylindrical magnetic domains produced in a magnetic crystal film supported on one side of a substrate, comprising a coplanar conductor disposed on and shortcircuited in a restricted transfer region of the film to feed-in a microwave signal, and a slot conductor shortcircuited in the transfer region and transformed into a wide band coplanar conductor to feed out signal variation in the region.

3,986,182

MULTI-ZONE INTRUSION DETECTION SYSTEM

Kenneth R. Hackett, Boulder, Colo., assignor to Sontrix, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 455,260, March 27, 1974. This application Jan. 21, 1975, Ser. No. 542,695
Int. Cl.[2] G08B *13/16*
U.S. Cl. 340—258 A 5 Claims



1. A multiple zone ultrasonic intrusion detection system comprising:
a master oscillator for generating power at ultrasonic frequency;
first transmitting transducer means energized by said master oscillator for radiating ultrasonic wave energy into a first zone;
first receiving transducer means for receiving ultrasonic wave energy from said first zone and converting received waves into electric signals;
second transmitting transducer means energized by said master oscillator for radiating ultrasonic waves into a second zone;
second receiving transducer means for receiving ultrasonic waves from said second zones and converting received waves into electric signals;
means for processing said electric signals from said first and second receiving transducer means to recover separate Doppler shifted components arising from moving objects within the respective zones; and
means responsive to said Doppler shifted components of predetermined magnitude for selectively indicating at a central location which of said zones contains a moving object.

3,986,183

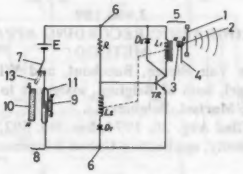
BURGLAR ALARM

Akinobu Fujiwara, 3204 Shimohatsukari, Hatsukari, Otsuki, Yamanashi 409-11, Japan

Filed June 3, 1975, Ser. No. 583,397
Claims priority, application Japan, Feb. 17, 1975, 50-21647[U]
Int. Cl.[3] G08B *13/08*
U.S. Cl. 340—276 1 Claim

1. A burglar alarm comprising a sound generating circuit, a power source and switch means coupled to said sound generating circuit, said switch means being closed in response to the relative movement of two magnets so that current can flow from said power source into said sound generating circuit and said switch means being rendered inoperative by insertion of a non-conducting key, wherein said sound generating circuit includes first and second coils of wire wound around a common iron core, first diode means connected in parallel with

said first coil, a resistor having one terminal thereof connected to one terminal of said second coil and the other terminal thereof connected to one terminal of said first coil, a transistor having the collector thereof connected to the other terminal of said first coil and having the base thereof connected between said resistor and said second coil, a second diode having the anode thereof connected to the other terminal of said second coil and the cathode thereof connected to the emitter of said transistor, repulsory hammering means having a permanent magnet moved in response to current flow in said first coil, and vibrating or sounding means actuated in response to movement of said hammering means for sounding, whereby



when the two magnets are moved away from each other, said switch means is closed so that a voltage is applied across said sound generating circuit, causing base current to flow through said resistor into the emitter of said transistor, thereby making said transistor conductive so that current from the power source can flow through the collector to the emitter of said transistor, energizing said first coil to move said hammering means while at almost the same moment said second coil has induced therein a back-electromotive force which cuts off said base current through said transistor so that said current through said first coil is cut off, permitting said hammering means to return to its initial position, thus making said current through said first coil flow intermittently.

3,986,184

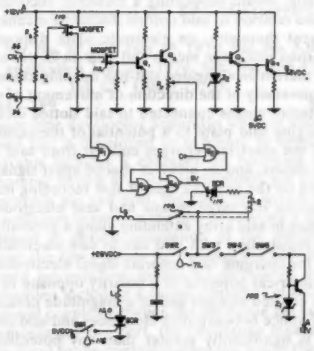
METHOD AND APPARATUS FOR DETERRING FALSE ALARMS

Joseph J. Castanino, East Bridgewater; John W. Lotus, Avon, and Alfred J. Meade, Franklin, all of Mass., assignors to False Alarm Deterrent Corporation, E. Bridgewater, Mass.

Filed June 17, 1975, Ser. No. 587,634

Int. Cl.² G08B *29/00, 25/00*

U.S. Cl. 340—304 **32 Claims**



1. A false alarm deterring actuator for an alarm comprising:

1. a housing;

2. fingerprint receiving means movably mounted with respect to said housing, said fingerprint receiving means having a plurality of movable finger button means each having a fingerprint receiving surface thereon;

3. means for moving said fingerprint receiving means from an operative position in which the fingerprint receiving means is accessible to an alarm sender to a retracted position within the housing in which the fingerprint receiving means is inaccessible to the alarm sender; and,

4. means responsive to pressure exerted on said fingerprint receiving means for (i) causing said moving means to move the fingerprint receiving means from the operative position to the retracted position and, (ii) actuating the alarm.

3,986,185

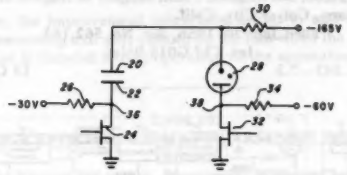
GAS DISCHARGE DISPLAY WITH CONTROL CELLS

Ernest G. Bylander, Grayson, Tex., assignor to Texas Instruments, Dallas, Tex.

Filed Dec. 23, 1974, Ser. No. 535,779

Int. Cl.² G06F *3/14*

U.S. Cl. 340—324 M **17 Claims**



1. A gas discharge display system comprising:

a. a gas-filled tube;

b. at least one group of segmented display electrodes disposed in said tube and adapted to be operated in different combinations to display different characters;

c. at least one non-display electrode disposed in said tube adjacent to said at least one group and responsive to a potential difference for ionizing and causing a glow discharge in the gas located between said display electrodes and said at least one non-display electrode; and

d. a plurality of gas discharge cell means each electrically interconnected to selected display electrodes for inhibiting the excitation of the gas located between said selected display electrodes and said at least one non-display electrode whenever the associated interconnected gas discharge cell is in a conducting state.

3,986,186

AUTOMATIC DISPLAY SEGMENT INTENSITY CONTROL

David S. Cochran, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 23, 1974, Ser. No. 535,311

Int. Cl.² G09F *9/32*

U.S. Cl. 340—335 **6 Claims**

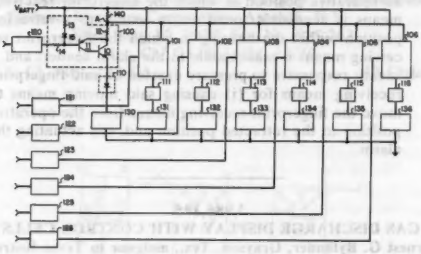
1. Apparatus for controlling the power to a display character having a plurality of light-emitting segments, said apparatus comprising:

a plurality of command circuits for producing command signals;

a plurality of electrical power sources coupled to the command circuits and the light-emitting segments for applying electrical power thereto in response to the command signals; and

proportioning means coupled to the electrical power

sources for controlling the amount of electrical power applied to the light-emitting segments in proportion to the



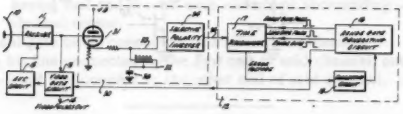
number of light-emitting segments energized to form the character.

3,986,187

AUTOMATIC SIGNAL TRACKING CIRCUIT

Don M. Jacob, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 30, 1956, Ser. No. 562,163
Int. Cl.² G01S 9/14
U.S. Cl. 343—7.3 13 Claims



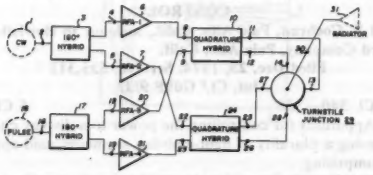
1. In an automatic target tracking radar system for tracking selected target signals in the presence of interfering signals, a range tracking circuit for automatically tracking selected received video signals, and means for modifying the video signals applied to said range tracking circuit, said means being selectively operable for placing an inverted replica of each received video signal either before or after each of said received signals, said inverted replica effecting the cancellation in said means of any non-inverted signals occurring in time coincidence therewith.

3,986,188

DUAL MODE MICROWAVE AMPLIFIER SUBSYSTEM

Richard Brownell True, Sunnyvale, Calif., assignor to Litton Systems, Inc., San Carlos, Calif.

Filed Sept. 9, 1974, Ser. No. 504,456
Int. Cl.² G01S 7/38; H04K 3/00
U.S. Cl. 343—18 E 5 Claims



4. In an electronic countermeasures system, the combination including:

a turnstile junction, said turnstile junction having four input arms arranged into two pairs of opposed arms, with the first and the third arms forming a first pair and the second and the fourth arms forming a second pair, and an output arm oriented orthogonal to each of said input arms;

first means for applying pulsed microwave energy signals to said first and third input arms in substantially equal level and substantially 180°out of phase;

second means for applying continuous wave microwave energy signals to said second and fourth input arms in substantially equal level and substantially 180° out of phase;

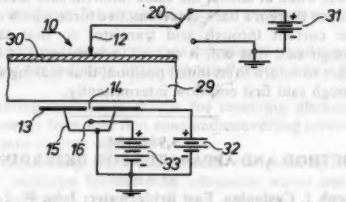
means coupled to said output arm for transmitting microwave energy therefrom.

3,986,189

DIELECTROGRAPHIC RECORDING APPARATUS AND METHOD

Jozef Antoon Van Biesen, Boechout, and Willy Joseph Palmans, Kessel, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Aug. 30, 1974, Ser. No. 502,181
Claims priority, application United Kingdom, Sept. 4, 1973, 41482/73
Int. Cl.² G03G 15/044; G01D 15/06
U.S. Cl. 346—74 J 3 Claims



1. A recording apparatus for recording on a dielectric material a pattern of electrical charges corresponding to intelligible information which apparatus comprises a corona discharge means for producing electrical charges of a given polarity and magnitude, means supporting a dielectric recording material in spaced relation to said corona discharge means for relative movement therewith, an electrode plate disposed between said corona discharge means and said dielectric material and having therein an elongated slot-like opening extending generally transversely of the direction of movement of said recording material, means connected to said slotted electrode plate for charging said plate to a potential of the same polarity as that of the electrical charges emitted from said corona discharge means, and an array of spaced apart signal electrodes arranged on the opposite side of said recording material from said corona discharge means and said electrode plate, the electrodes in said array extending along a generally transverse line in registration with said slot in said electrode plate, and means for charging said separate signal electrodes selectively to an electrical potential of a polarity opposite to that of said corona emitted charges and of a magnitude creating a potential difference between such electrodes and said corona means which is significantly greater than any potential difference between said slotted electrode plate and said corona means, whereby the repulsive effect upon the corona emitted charges of the similarly charged slotted electrode plate is selectively overcome by the stronger field localized between the corona means and any connected signal electrode.

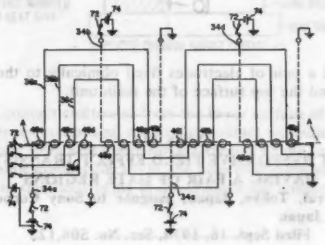
3,986,190
SYSTEM FOR GENERATING MAGNETIC IMAGES

Eberhard A. Schwabe, Bergstr. 34, 5202 Hennef, Sieg 1, Germany, and Donald M. Came, 27 Stanton Road, Brookline, Mass. 02146

Continuation-in-part of Ser. No. 456,790, April 1, 1974, abandoned, which is a continuation of Ser. No. 195,323, Nov. 3, 1971, abandoned. This application Apr. 2, 1975, Ser. No. 564,372

Int. Cl.² G03G *19/00*

U.S. Cl. 346—74.1 **13 Claims**



1. A system for generating closely spaced magnetic images comprising

A. a recording medium,

B. a recording head positioned opposite the medium, said head including at least two distinct vertically juxtaposed layers of different electrical conductors, there being at least two conductors in each layer, said conductors in each layer having segments which are in close proximity with, substantially parallel to and vertically superimposed on segments of conductors in the other layers to form at least four magnetically active centers with each such center being defined by two or more parallel superimposed conductors, one conductor from each layer, and

C. means for selectively passing electrical currents simultaneously through all of the conductors defining a magnetically active center so as to generate coinciding magnetic fields at that selected magnetically active center which are additive so that together they are sufficiently strong to change the direction of magnetization is a selected small area of the recording medium.

3,986,191
APPARATUS FOR DEVELOPING DIAZO TYPE FILM

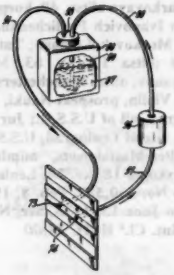
Carl A. Ackermann, and Patrick F. McPherson, both of Deep River, Conn., assignors to Blu-Ray, Incorporated, Essex, Conn.

Division of Ser. No. 59,553, July 30, 1970, Pat. No. 3,804,515. This application Jan. 22, 1974, Ser. No. 435,473

Int. Cl.² G03D *13/00*

U.S. Cl. 354—299 **4 Claims**

1. In a diazo type developing apparatus wherein diazo sensitized exposed film is developed by exposure to ammonia gas which apparatus includes a chamber for receiving exposed film, the chamber having at least one ammonia gas entry port and one ammonia gas exit port, the chamber having a height and length sufficient to receive the film and having a minimum width sufficient to permit circulation of the ammonia gas therein about the film, means for heating the chamber to a predetermined temperature, means for circulating ammonia gas in the chamber including a closed container of ammonium hydroxide liquid coupled between the ammonia gas entry port and the ammonia gas exit port, the circulating means further including an input to the container disposed below the level of the liquid and an output from the container disposed above the level of the liquid and coupled to the gas entry port of the chamber, the circulating means still further including a pump coupled between the gas exit port of the chamber and the input to the container for bubbling ammonia gas through the liquid and circulating it between the chamber and the container; the improvement comprising means in said chamber for preventing exit port closure by the film when the pressure thereat is reduced during operation of the apparatus.



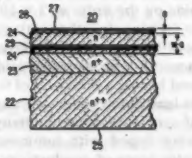
3,986,192
HIGH EFFICIENCY GALLIUM ARSENIDE IMPATT DIODES

James Vincent DiLorenzo, Piscataway; William Charles Niehaus, Murray Hill, and Lawrence John Varnerin, Jr., Watchung, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 2, 1975, Ser. No. 538,082

Int. Cl.² H01L *29/90, 29/88, 29/48, 29/56*

U.S. Cl. 357—13 **3 Claims**



1. A high efficiency gallium arsenide Schottky barrier diode comprising:

a. a gallium arsenide substrate having two major opposed surfaces;

b. an electrical contact covering at least a portion of a first major surface of the substrate;

c. at least one epitaxially deposited gallium arsenide layer covering at least a portion of a second major surface of the substrate and including a first region of relatively higher concentration of impurity as compared with the deposited layer; and

d. a rectifying barrier contact contacting the epitaxially deposited layer,

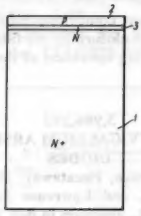
characterized in that the epitaxially deposited gallium arsenide layer further includes a second region of relatively higher concentration of impurity, located between the first region and the substrate.

3,986,193

SEMICONDUCTOR SICL LIGHT SOURCE AND A METHOD OF MANUFACTURING SAME

Jury Alexandrovich Vodakov, prospekt Engelsa, 69/1, kv. 35; Galina Alexandrovna Lomakina, prospekt Engelsa, 69/1, kv. 109; Evgeny Nikolaevich Mokhov, prospekt Energetikov, 54, korpus 2, kv. 59, all of Leningrad; Igor Ivanovich Kruglov, 15 Parkovaya, 46, korpus 1, kv. 35; Igor Veniaminovich Ryzhikov, 9 Parkovaya ulitsa, 49, korpus 1, kv. 67, both of Moscow; Vadim Ivanovich Pavlichenko, ulitsa Polevaya, 20/1, Kaliningrad Moskovskoi oblasti; Tatyana Georgievna Kmita, Odesskaya ulitsa 17, kv. 63, Moscow; Georgy Fedorovich Kholuyanov, ulitsa Manchesterskaya, 18, kv. 73; Eduard Efimovich Violin, prospekt Nauki, 16, korpus 1, kv. 89, both of Leningrad, all of U.S.S.R.; Jury Petrovich Maslakovets, deceased, late of Leningrad, U.S.S.R., and by Irina Vladimirovna Valter-Maslakovets, administratrix, ulitsa Vsevoloda Vishnevskogo, 18, kv. 24, Leningrad, U.S.S.R.

Continuation of Ser. No. 330,587, Feb. 8, 1973, abandoned.
This application June 13, 1975, Ser. No. 586,791
Int. Cl.[2] H01L *33/00*
U.S. Cl. 357—17 10 Claims



1. A semiconductor light source comprising a silicon carbide crystal having a three-layer structure comprising: an N-type conductivity base region doped with nitrogen and having a concentration of basic uncompensated donors varying from 0.8×10^{18} to 5×10^{18} cm^{-3}; a P-type conductivity layer having a thickness of 0.05 to 1 micron, doped with an acceptor admixture having a minimal activation energy and solubility in said silicon carbide on the order of 2×10^{18} to 2×10^{20} cm^{-3}, said P-type layer forming, together with said N-type region, a P-N junction; an N-type conductivity layer of silicon carbide located between said P-type layer and said N-type conductivity base region and having a thickness of 0.05 to 1 micron and a resistivity of at least three orders of magnitude higher than the resistivity of said N-type conductivity base region, said N-type layer being doped with luminescence activators of donor and acceptor types of conductivity to a concentration of 0.1×10^{18} to 2×10^{18} cm^{-3}.

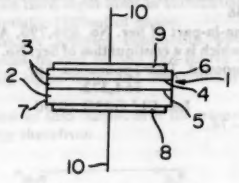
3,986,194

MAGNETIC SEMICONDUCTOR DEVICE

Katashi Masumoto, and Nobuyuki Koguchi, both of Tokyo, Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Aug. 11, 1975, Ser. No. 603,628
Claims priority, application Japan, Aug. 15, 1974, 49-92754
Int. Cl.[2] H01S *33/19*; H01L *29/161*, *27/22*
U.S. Cl. 357—18 11 Claims

1. An injection-type laser light emitting magnetic semiconductor device comprising a main unit in the shape of a generally rectangular parallelepiped comprising a layer of a magnetic semiconductor for emitting laser light and at least one layer of semiconductor having the same crystal structure and substantially the same lattice constant as those of the magnetic semiconductor and also having a greater optical energy gap than that of the magnetic semiconductor, both end surfaces of the main unit perpendicular to the coalescing surface of the two layers serving as reflecting plates for the emission of laser light; and a pair of electrodes fixed ohmically to the under surface and the top surface of the main unit.

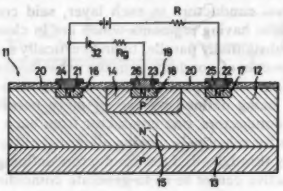


3,986,195

LIGHT RESPONSIVE FIELD EFFECT TRANSISTOR HAVING A PAIR OF GATE REGIONS

Michio Arai, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 16, 1974, Ser. No. 506,123
Claims priority, application Japan, Sept. 27, 1973, 48-109144
The portion of the term of this patent subsequent to Feb. 25, 1992, has been disclaimed.
Int. Cl.[2] H03K *3/353*, *3/42*; H01L *29/80*, *27/14*
U.S. Cl. 307—304 2 Claims



1. A field effect device for receiving light energy and producing output photo current indicative of the intensity of the light energy comprising a first semiconductor channel region of a first conductivity type, a second semiconductor gate region of second conductivity type adjoining said channel region, source and drain electrode regions formed at opposite ends of said channel region, a third semiconductor region of a first conductivity type formed in said gate region and having a gate electrode attached thereto, a gate control circuit connected between said gate and source electrodes for injecting minority carriers into said gate region from said third semiconductor region, and said third semiconductor region being spaced from said channel region by a predetermined distance smaller than the diffusion length of the minority carriers in said gate region, an output circuit connected between said source and drain electrode regions in said channel region varying in response to light energy incident on said field effect device.

3,986,196

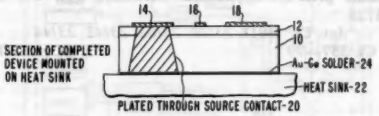
THROUGH-SUBSTRATE SOURCE CONTACT FOR MICROWAVE FET

David Richard Decker, Los Altos, and Masahiro Omori, Palo Alto, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed June 30, 1975, Ser. No. 591,690
Int. Cl.[2] H01L *29/80*, *29/06*, *23/48*, *23/02*
U.S. Cl. 357—22 9 Claims

1. A field effect transistor comprising a body of semiconductive material having upper and lower surfaces, at least

three spaced metallic electrodes on the upper surface of said body, a first of which is positioned between the second and third of said electrodes in the plane of said surface, said first electrode making a rectifying contact to said surface, said second and third electrodes each making an ohmic contact to said surface, and means providing a contact to one of said



ohmic contact electrodes from the lower surface of said body, said means comprising a metallic contact extending through said body from said lower surface thereof to the underside of said ohmic contact electrode, the sides of said metallic contact adjacent said body being in direct electrical contact with said body.

3,986,197

CHARGE COUPLED TRANSFER ARRANGEMENT IN WHICH MAJORITY CARRIERS ARE USED FOR THE CHARGE TRANSFER

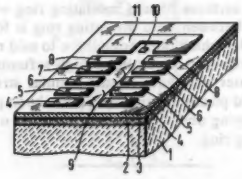
Ulrich Ablassmeier, Waltenhofen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 3, 1975, Ser. No. 538,383

Claims priority, application Germany, Jan. 3, 1974, 2400208

Int. Cl.² H01L *29/78*; H03K *3/353*

U.S. Cl. 357—24 **5 Claims**



1. A charge coupled transfer arrangement comprising a thin doped semiconductor layer of one conductivity type having majority carriers, a highly resistive material in relation to said semiconductor layer and carrying said semiconductor layer, an insulating layer carried on said semiconductor layer, input electrode means carried on said insulating layer, output electrode means carried on said insulating layer, a plurality of groups of electrodes carried on said insulating layer, said groups of electrodes aligned spaced apart in a row parallel to a predetermined direction of charge transfer and each of said groups comprising individual electrodes extending laterally of said predetermined direction and separated from adjacent electrodes of the same group by respective gaps, means for applying voltages, of such polarity as to repel majority carriers in said semiconductor layer, to said electrodes to transfer said electrical majority carriers adjacent to said row in said direction in said semiconductor layer below said gaps, and means for applying voltage to clear said semiconductor layer of said majority carriers below said electrodes with the exception of areas below said gaps.

3,986,198

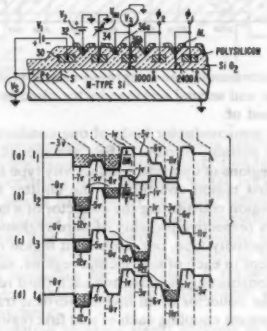
INTRODUCING SIGNAL AT LOW NOISE LEVEL TO CHARGE-COUPLED CIRCUIT

Walter Frank Kosonocky, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 369,580, June 13, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,563

Int. Cl.² H01L *29/78*

U.S. Cl. 357—24 **9 Claims**



1. A charge-coupled circuit comprising, in combination:

a semiconductor substrate of one conductivity type;

a diffusion in said substrate of different conductivity type;

a plurality of electrode means coupled to and insulated from said substrate for producing potentials at the substrate for the accumulation and propagation of charge signals originating at said diffusion;

means including a first of said electrode means close to said diffusion and means for applying a potential to said first electrode means for forming a conduction channel for charge carriers in said substrate between said diffusion and the region of said substrate beneath said first electrode means;

means for applying a signal potential whose value may vary between a second of said electrode means adjacent to said first electrode means and said first electrode means for producing a potential well of a depth sufficient to accumulate charge carriers flowing through said conduction channel;

means for applying a potential to a third of said electrode means adjacent to the second of said electrode means for producing a first potential barrier at the substrate;

means for operating said diffusion at a potential such that it produces charge carriers which flow through said conduction channel for an interval at least sufficient to fill said well to a given depth with carriers; and

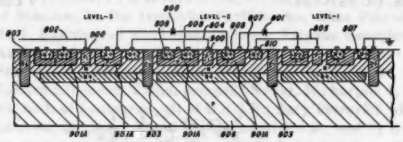
means for changing the difference in potential between said diffusion and said second electrode means in a sense to permit said diffusion to operate as a drain for charge carriers in excess in said potential well while said signal potential is present between said first electrode means and said second electrode means such that a potential barrier is present between said diffusion and first well of a height lower than said first barrier and which permits a number of charge carriers to flow out of said well to said diffusion sufficient to leave in said well charge at a level indicative of said signal potential.

3,986,199

BIPOLAR LOGIC HAVING GRADED POWER

Clark R. Williams, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 19, 1974, Ser. No. 443,585
Int. Cl.² H01L 27/02, 29/72, 27/10, 27/04
U.S. Cl. 357—46 9 Claims



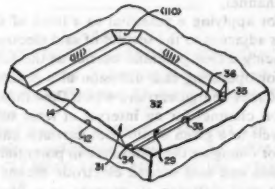
1. A semiconductor integrated circuit system comprising:
a. first and second semiconductor circuits each being comprised of:
i. a semiconductor body of one conductivity type,
ii. a plurality of pairs of first and second mutually spaced regions of opposite conductivity type in said body, each first region constituting the emitter and each second region constituting the collector of a lateral transistor,
iii. a respective plurality of third regions of said one conductivity type, one such third region respectively adjacent to each of said second regions, each second region constituting the base and each third region constituting the collector of an inverse vertical transistor, and
iv. means coupling each of said first regions in common,
v. said semiconductor body constituting a common base region for each of said lateral transistors and a common emitter region for each of said vertical transistors; and
b. power input means including a current regulator coupled to provide an approximately constant current between the third region and the commonly coupled first regions of each of said first and second circuits;
c. each of the first regions of said first circuit being larger in size than each of the first regions of said second circuit wherein a greater quantity of current is injected into each of said vertical transistors of said first circuit than is injected into each of said vertical transistors of said second circuit.

3,986,200

SEMICONDUCTOR STRUCTURE AND METHOD

David F. Allison, Los Altos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 429,933, Jan. 2, 1974, Pat. No. 3,883,948.
This application Feb. 24, 1975, Ser. No. 552,244
Int. Cl.² H01L 21/308, 27/04, 29/04
U.S. Cl. 357—55 8 Claims



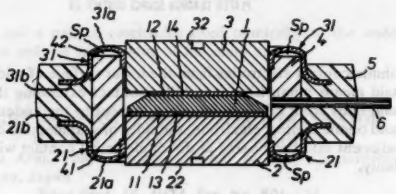
5. In a semiconductor structure, a semiconductor body having an impurity of one conductivity type therein and having a major surface lying in the <100> plane, generally rectangular moats extending through said surface and having spaced side walls lying in planes different from the <100> plane and outside corners having diagonal side wall portions formed therein.

3,986,201

HIGH OUTPUT WAFER-SHAPED SEMICONDUCTOR COMPONENT WITH PLASTIC COATING

Ludwig Herold, Warstein; Wolfgang Pikorz, Belecke, and Alois Sonntag, Mulheim, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Dec. 24, 1974, Ser. No. 536,211
Claims priority, application Germany, Dec. 27, 1973, 2364728
Int. Cl.² H01L 23/28, 23/02, 23/42, 23/44
U.S. Cl. 357—79 6 Claims



1. In a high output semiconductor device which is tightly encased in a plastic coating, said device including a wafer-shaped semiconductor body having electrodes at its opposed major surfaces, two cylindrical metal bodies serving as current connecting means and as means for dissipating heat contacting said electrodes of said semiconductor body at said respective major surfaces, a hollow cylindrical insulating ring which encloses and centers said metal bodies and said semiconductor body, and a pair of annular sheet metal strips each connecting one of said metal bodies to said plastic jacket so as to seal said semiconductor body; the improvement wherein: said pair of annular sheet metal strips each has a dished portion adjacent its inner periphery; the inner periphery of each of said strips is fastened to the superficies of a respective one of said two metal bodies with said dished portions enclosing the respective edge surfaces of said insulating ring while leaving an air gap therebetween; said insulating ring is formed of an insulating material which does not adhere to said metal bodies or said metal strips and which has a high softening temperature; and the outer periphery of said annular strips is rigidly embedded in said plastic coating which has been produced by encasing or spraying under pressure around the outer surface of said insulating ring.

3,986,202

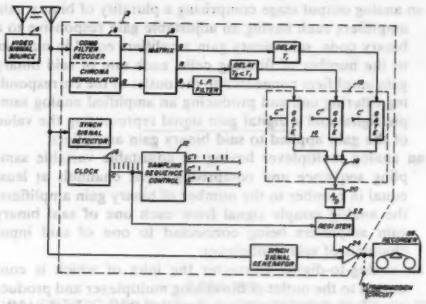
PROCESSING APPARATUS AND METHOD FOR COLOR VIDEO SIGNALS

Edward M. Granger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,479
Int. Cl.² H04N 5/76, 9/02
U.S. Cl. 358—4 6 Claims

1. In a color video system which produces contemporaneous image signals from which a set of basic colors may be derived, a signal processor comprising:
means for sampling said signals, such means including (a) means for programming a color sampling sequence wherein basic color samples occur at rates related to the resolution of the human visual system for detail in such colors, and (b) means responsive to said sequence programming means for extracting basic color samples from said image signals in accordance with said basic color sequence;
means for receiving and for combining the basic color samples into a time-division-multiplexed signal;
intermediate means for receiving said time-division-multiplexed signal; and

means for receiving said time-division-multiplexed signal from said intermediate means for separating the basic



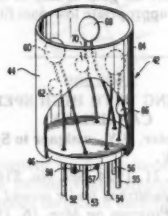
color samples and for applying them to respective signal channels based on said preselected sequence.

3,986,203

METHOD AND APPARATUS FOR TESTING TELEVISION RECEIVERS

John C. Davis, 1605 Stuart, Albany, Ga. 31707

Filed Dec. 3, 1975, Ser. No. 637,218
Int. Cl.² H04N 9/62
U.S. Cl. 358—10 10 Claims



8. Apparatus for localizing a source of faulty color operation of a color television receiver having an image producing element and a chassis providing signals to the image producing element through sockets in a chassis output signal connector removably received by an input signal connector on the image producing element, said apparatus comprising:

a plurality of visual voltage magnitude indicators for visually indicating at least relative voltage levels of an applied signal; and,

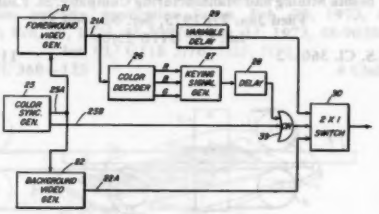
means for effecting individual electrical connections between each of a plurality of the sockets of the chassis output signal connector and respective ones of said plurality of visual voltage magnitude indicators with the chassis output signal connector removed from the image producing element input signal connector, whereby a source of faulty operation of the television receiver can be localized to either the image producing element or the chassis through manipulation of the customer color controls on the television receiver.

3,986,204

VIDEO SYNCHRONIZING APPARATUS AND METHOD

Clyde Smith, North Salem, N.Y., assignor to Thomson-CSF Laboratories, Inc., Stamford, Conn.

Filed Feb. 6, 1975, Ser. No. 547,390
Int. Cl.² H04N 5/22, 9/535, 5/06
U.S. Cl. 358—22 6 Claims



1. For use in conjunction with a processing system which receives an input television video signal comprising successive scanlines each consisting of a blanking signal portion that includes timing signals followed by an active signal portion representative of picture information, said processing system having an inherent time delay whereby the output thereof is a television video signal delayed with respect to the input video signal; an apparatus for generating a revised output video signal having timing signals in synchronism with said input video, comprising:

means for generating blanking signal portions in synchronism with the blanking signal portions of said input video;

means for selecting signal portions of the output of said processing system which occur between the generated blanking signal portions; and

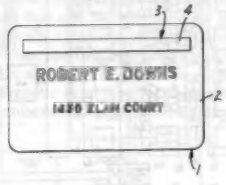
means for combining the generated blanking signal portions and the selected signal portions to produce said revised output video signal.

3,986,205

DUAL PARTICLE POPULATION MAGNETIC RECORDING MEDIUM

Richard E. Fayling, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 27, 1975, Ser. No. 544,551
Int. Cl.² G11B 25/04
U.S. Cl. 360—2 15 Claims



1. A magnetic recording medium comprising:

a first population of magnetic recording particles; and

at least a second population of uniformly aligned uniaxially highly anisotropic magnetic recording particles with an easy axis and a plurality of hard axes of magnetization and an easy axis intrinsic coercive force less than 1900 oersteds, whereby when said second population is initially magnetized with a field of at least 2500 oersteds applied along said easy axis, the level of residual magnetic moment of said population will be greater than 40% of the initial residual magnetic moment after the application along one of said hard axes of an a.c. erase field of peak

value equal to two times the intrinsic easy axis coercive force of the second population.

3,986,206

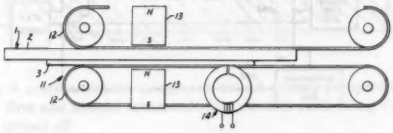
MAGNETIC RECORDING MEDIUM WITH HIGHLY ANISOTROPIC PARTICLES

Richard E. Fayling, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 27, 1975, Ser. No. 544,553

Int. Cl.² G11B *25/04*

U.S. Cl. 360—2 **11 Claims**



1. A magnetic recording medium that includes a uniformly aligned population of uniaxially highly anisotropic particles with an easy axis and a plurality of hard axes of magnetization and an easy axis intrinsic coercive force less than 1900 oersteds, whereby when said population is initially magnetized with a field of at least 2500 oersteds applied along said easy axis, the level of residual magnetic moment of said population will be greater than 40% of the initial residual magnetic moment after the application along one of said hard axes of an a.c. erase field of peak value equal to two times the intrinsic easy axis coercive force of the population.

3,986,207

APPARATUS FOR RECORDING IN A DIGITAL FORM SIGNALS DETECTED DURING MAGNETO-TELLURIC PROSPECTION

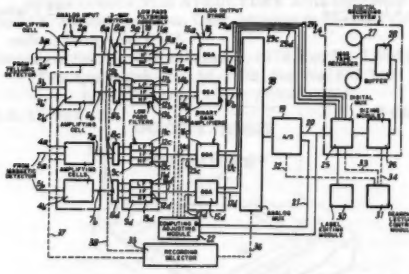
Lucien Gerbel, and Michel Waeselynck, both of Pau, France, assignors to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

Filed May 19, 1975, Ser. No. 579,021

Claims priority, application France, May 21, 1974, 74.17606

Int. Cl.² G11B *5/00;* **G01D** *15/12;* **G01V** *3/12*

U.S. Cl. 360—6 **11 Claims**



1. A recording apparatus for automatically recording digital signals generated from telluric and magnetic detectors during magneto-telluric prospecting, said apparatus comprising:

an analog input stage comprising a plurality of amplifying cells the number of which is at least equal to the number of said telluric and magnetic detectors, at least one amplifying cell corresponding to each detector;

a low-pass filtering stage comprising a plurality of filtering cells equal in number to the number of amplifying cells each one of said filtering cells comprising a low-frequency low-pass filter, an intermediate frequency low-pass filter and a high frequency low-pass filter, each one of said filters having a predetermined cut-off frequency, the respective inlets of the low-pass filters of a given filtering cell being sequentially connected to the outlet of the corresponding amplifying cell;

an analog output stage comprising a plurality of binary gain amplifiers each having an adjustable gain responsive to a binary code, said binary gain amplifiers equal in number to the number of filtering cells, each one of said binary gain amplifiers connected to the outlet of the corresponding filtering cell and producing an amplified analog sample signal and a digital gain signal representing the value of the gain applied to said binary gain amplifiers;

an analog multiplexer having an adjustable variable sampling sequence and comprising input channels at least equal in number to the number of binary gain amplifiers, the analog sample signal from each one of said binary gain amplifiers being connected to one of said input channels of said multiplexer;

an analog-to-digital converter the inlet of which is connected to the outlet of the analog multiplexer and producing a first digital signal respresenting the amplitude of the analog sample signal received by the multiplexer, and a second digital signal representing the address of the channel of the multiplexer corresponding to the received sample signal;

a gain computing module receiving each of the signals produced by the analog-to-digital converter and producing for each of the binary gain amplifiers an optimum gain setting;

a digital recording system receiving said first and said second digital signals from the analog-to-digital converter; and

a recording selector connected to the analog multiplexer, at least one of said amplifying cells, and to the filtering cells of the filtering stage, said selector being adapted to select for each one of the recording types comprising low-frequency recording, intermediate-frequency recording and high-frequency recording, the sampling frequency of the analog multiplexer, the gain of said at least one amplifying cells, and the appropriate low-pass filter of each filtering cell.

3,986,208

DATA RECORDING WITH HIGH SPEED SEARCH CAPABILITY

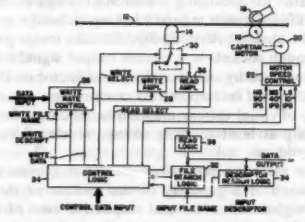
John R. Sykes, Rochester, N.Y., assignor to Sykes Datatronics, Inc., Rochester, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,069

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² G11B *5/09*

U.S. Cl. 360—49 **17 Claims**



1. For use in apparatus for writing and reading data signals on a tape record medium, a system for providing different access times for different items of data, said system comprising means for writing data signals representing each of said different items at different successively higher densities on said medium, and means for reading said data signals from

said tape when said tape is travelling at different successively lower speeds, each corresponding to a different one of said densities whereby to provide access to items of data written at the lowest of said densities in the shortest time.

3,986,209

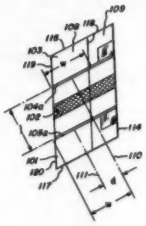
MAGNETIC READ HEAD WITH OFFSET FLUX GAPS

Harold James Beecroft, Minneapolis; Thomas Francis Burniece, III, Edina, and Douglas Joseph Hennenfent, Minneapolis, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Division of Ser. No. 458,262, April 5, 1974. This application May 19, 1975, Ser. No. 578,568

Int. Cl.[2] G11B *5/28*

U.S. Cl. 360—121 **6 Claims**



1. A unitary magnetic head core having at least two separate flux paths and a parallel-edged transducing face forming a portion of the outside surface of each flux path, each flux path containing a flux gap of substantially identical effective width, the flux gaps being positioned to intersect the transducing face, each pair of line segments formed by the intersection of any two flux gaps with the transducing face being paralled and with the parallel edges of said transducing face forming a non-rectangular parallelogram.

3,986,210

MAGNETIC HEAD DEVICE USING PRINTED CIRCUIT TECHNIQUES

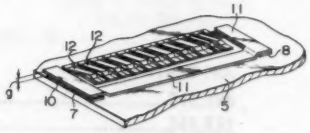
Hiroshi Sugaya, Suita; Takeshi Ishihara, Neyagawa; Fukashi Kobayashi, Hirakata, and Kenji Kanai, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 13, 1974, Ser. No. 442,197

Claims priority, application Japan, Feb. 20, 1973, 48-20875; Feb. 20, 1973, 48-20876; Aug. 11, 1973, 48-90388

Int. Cl.[2] G11B *5/16, 5/25, 5/20*

U.S. Cl. 360—123 **4 Claims**



1. A magnetic head comprising:

a semiconductor substrate;

a plurality of elongated substantially parallel and coplanar first conductors formed in and contiguous with the surface of said substrate by diffusion or implantation and defining substantially one half of a magnetic coil;

a first magnetic material layer evaporated on said substrate, said first layer including an elongated central portion extending over and insulated from said plurality of first coil half conductors and an elongated first end portion extending substantially normally to said elongated central portion;

a plurality of elongated substantially parallel and coplanar second conductors formed on said substrate, each second conductor extending over and insulated from said central portion of said first magnetic material layer between and in contact with one end portion of one first coil half conductor and an opposite end portion of a next adjacent first coil half conductor to form a second half of said magnetic coil;

a non-magnetic material formed over said first end portion of said first magnetic material layer to a depth which defines a magnetic head gap; and

a second magnetic material layer formed on said substrate and having one end portion extending over said non-magnetic material layer and said first end portion of said first magnetic material layer and a second end portion extending over a second end portion of said first magnetic material layer, said first and second magnetic material layers being magnetically coupled to each other at their respective end portions, the first end portions of said magnetic material layers and the interposed non-magnetic material defining a magnetic head face for magnetic engagement with a magnetic recording/reproducing medium.

DESIGN PATENTS

GRANTED OCTOBER 12, 1976

ERRATA

For CLASS	See PATENT NO.
011–148	241,796
025–034	241,831
025–034	241,832
025–013	241,833
096–012 R	241,859
011–156	241,874
011–164	241,875
015–066	241,876
015–123	241,880
030–099	241,887

DESIGN PATENTS

GRANTED OCTOBER 12, 1976

ERRATA

Class	Des. Patent No.
D11-145	241,760
D25-034	241,871
D25-034	241,872
D25-012	241,873
D96-072 R	241,874
D11-154	241,875
D17-.404	241,876
D15-.000	241,878
D15-122	241,880
D30-099	241,927

DESIGNS

OCTOBER 12, 1976

241,788
APRON
Jeanette Witzig, 2905 E. 65th St., Long Beach, Calif. 90805
Filed Nov. 6, 1974, Ser. No. 521,249
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—229

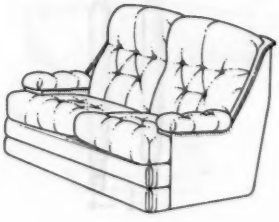
241,789
KEY-RING HOLDER
Roger S. Reiss, 260 Waverly Ave., Newton, Mass. 02158
Filed Apr. 2, 1975, Ser. No. 564,455
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400

241,790
JEWELRY DISPLAY STAND
Herbert H. Longen, 3207 67th Ave. N., Brooklyn Center, Minn. 55429
Filed Oct. 29, 1975, Ser. No. 626,717
Term of patent 3½ years
Int. Cl. D20—*02*
U.S. Cl. D6—28

241,791
LOUNGE CHAIR
Robert Tillberg, P.O. Box 79, S–260 40, Viken, Sweden
Filed Nov. 6, 1974, Ser. No. 521,379
Claims priority, application Sweden May 8, 1974
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

241,792
CHAIR
John C. Wehner, 103 Orchard St., Apt. 6, Somerville, Mass. 02144
Filed Nov. 29, 1974, Ser. No. 528,254
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—41

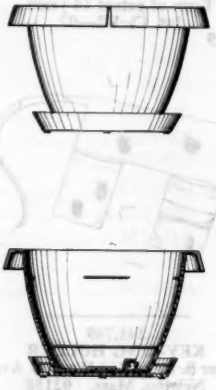
241,793
SEAT
Thomas Winrow, Naperville, Ill., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Mar. 21, 1975, Ser. No. 560,839
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



241,794
SOFA OR SIMILAR ARTICLE
Robert L. Jaycox, Chicago, Ill., assignor to Kroehler Mfg. Co., Naperville, Ill.
Filed May 16, 1975, Ser. No. 578,351
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

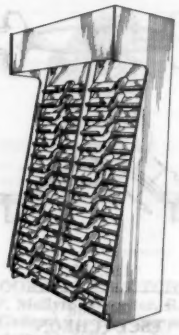
241,795
CHAIR
Lee Harold Fister, Jr., 7715 Park Creek Drive, Dayton, Ohio 45459
Filed Feb. 10, 1975, Ser. No. 548,275
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

241,796
COMBINED HANGING PLANTER AND DETACHABLE SAUCER THEREFOR
Ted Dziewulski, Bartlett, Ill., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed May 14, 1975, Ser. No. 577,499
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—148

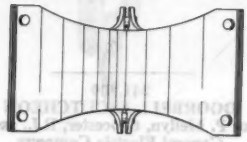


241,797
MAGAZINE RACK OR SIMILAR ARTICLE
Jack P. Kocsis, 675 Sayre Ave., Phillipsburg, N.J. 08865
Filed Dec. 5, 1974, Ser. No. 529,793
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—184

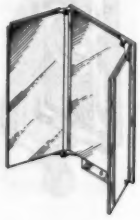
241,798
DISPLAY RACK FOR RESILIENT FLOORING SAMPLES OR THE LIKE
Gerard M. Schouten, Lititz, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed May 15, 1975, Ser. No. 577,640
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—188



241,799
FURNITURE BASE OR SIMILAR ARTICLE
Kenichi Koyama, Yokohama, Japan, assignor to Central Glass Company, Limited
Filed July 23, 1975, Ser. No. 598,403
Claims priority, application Japan Aug. 13, 1973
Term of patent 7 years
Int. Cl. D6—*06*
U.S. Cl. D6—196



241,800
MIRROR
Lawrence H. Johnson, 944 King George Way, El Dorado Hills, Calif. 95630, and Leslie B. Korner, 1908 Manzanita Way, West Sacramento, Calif. 95691
Filed May 24, 1974, Ser. No. 473,007
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234

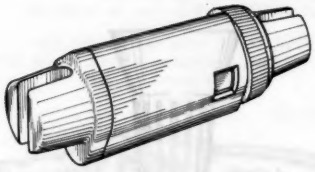


241,801
DESSERT CUP
Albert E. Colato, St. Paul, Minn., assignor to American Dairy Queen Corp.
Continuation of abandoned design application Ser. No. 392,661, Aug. 29, 1973. This application June 26, 1975, Ser. No. 590,620
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—14

241,802
INSULATED COMBINED FOOD HOLDER AND SERVING TRAY
Wayne W. Beaubian, 1410 Civic Center Drive, East Brunswick, N.J. 08816
Filed Apr. 17, 1974, Ser. No. 461,490
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D7—77

241,803
SCULPTURING TOOL
Anne T. Amiot, 18132 Audette, Dearborn, Mich. 48124
Filed Feb. 26, 1973, Ser. No. 336,035
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D8—14

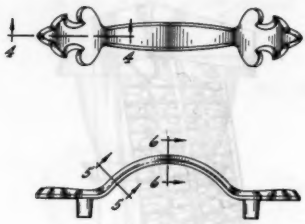
241,804
BICYCLE LOCK
Shigeru Kawakami, 17–3 Higashi Shinkoiwa, 6-chome, Katsushika-ku, Tokyo, Japan
Filed May 21, 1975, Ser. No. 579,673
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—113



241,805
COMBINATION PADLOCK
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Elmwood Park, N.J.
Filed Jan. 30, 1976, Ser. No. 653,721
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—114

241,806
MOTORCYCLE HAND GRIP OR THE LIKE
George A. Johnson, 27239 Barada Ave., Saugus, Calif. 91350
Filed Apr. 24, 1975, Ser. No. 571,377
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D8—138

241,807
PULL
La Verne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Sept. 8, 1975, Ser. No. 611,348
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—166



241,808
ESCUTCHEON
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Sept. 17, 1975, Ser. No. 614,313
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—179

241,809
DOORBELL ESCUTCHEON
Lawrence P. Mellyn, Glocester, R.I., assignor to General Electric Company
Filed Aug. 31, 1973, Ser. No. 393,459
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—181

241,810
DOORBELL ESCUTCHEON
Lawrence P. Mellyn, Glocester, R.I., assignor to General Electric Company
Filed Aug. 31, 1973, Ser. No. 393,455
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—182

241,811
DOORBELL ESCUTCHEON
Lawrence P. Mellyn, Glocester, R.I., assignor to General Electric Company
Filed Aug. 31, 1973, Ser. No. 393,456
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—182

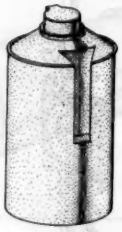
241,812
DOORBELL ESCUTCHEON
Lawrence P. Mellyn, Glocester, R.I., assignor to General Electric Company
Filed Aug. 31, 1973, Ser. No. 393,457
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—182

241,813
DOORBELL ESCUTCHEON
Lawrence P. Mellyn, Glocester, R.I., assignor to General Electric Company
Filed Aug. 31, 1973, Ser. No. 393,470
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—181

241,814
STRETCHING SCREW
Lars Fredriksson, Vaxjo, Sweden, assignor to K. A. Bergs Smide AB, Gemla, Sweden
Filed Aug. 1, 1975, Ser. No. 601,190
Claims priority, application Sweden Jan. 31, 1975
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—229

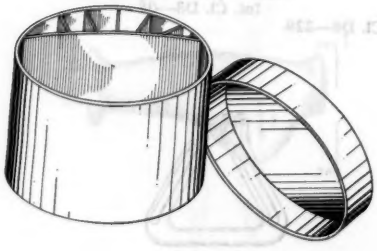
241,815
BAND COUPLING FOR SAFETY HOOK
Lars Fredriksson, Vaxjo, Sweden, assignor to K. A. Bergs Smide AB, Gemla, Sweden
Filed Oct. 10, 1975, Ser. No. 621,287
Claims priority, application Sweden Apr. 18, 1975
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—229

241,816
DISPENSING CONTAINER FOR A SHAVING COMPOSITION OR THE LIKE
Yoshinari Kusakawa, 1–34–23 Kamiikedai, Otaku, Tokyo, Japan
Filed Mar. 18, 1975, Ser. No. 559,622
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—9



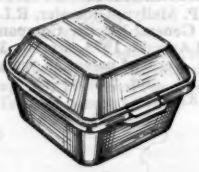
241,817
BOTTLE
Paul R. Campbell and William J. O'Neil, Jr., Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Feb. 6, 1975, Ser. No. 547,526
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—66

241,818
COMPARTMENTED BOX
Frances V. Hejna, 44 State Highway, Edgewater, N.J. 07020
Filed Dec. 23, 1974, Ser. No. 535,639
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185



241,819
PACKAGE OF ANIMAL FOOD OR THE LIKE
Raimund Flecken, Steinbach, Taunus, Germany, assignor to J. Latscha Frankfurt KG
Filed Sept. 11, 1973, Ser. No. 396,216
Claims priority, application Germany Mar. 12, 1973
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193

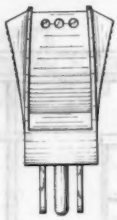
241,820
FOAM PACKAGING TRAY FOR FOOD
Donald K. Jewell, Naperville, Ill., assignor to Restaurant Technology, Inc.
Filed Jan. 29, 1975, Ser. No. 544,872
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



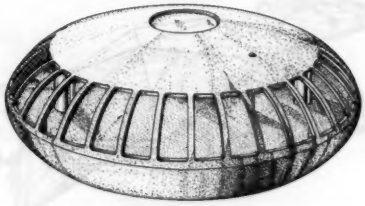
241,821
FOAM PACKAGING TRAY FOR FOOD
Donald K. Jewell, Naperville, Ill., assignor to Restaurant Technology, Inc.
Filed Jan. 29, 1975, Ser. No. 544,871
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

241,822
FOAM PACKAGING TRAY FOR FOOD
Donald K. Jewell, Naperville, Ill., assignor to Restaurant Technology, Inc.
Filed Dec. 6, 1974, Ser. No. 530,209
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—235

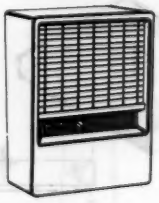
241,823
CIRCUIT ANALYZER OR SIMILAR ARTICLE
Marnie Carlton Averitt, Timonium, Md., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Sept. 18, 1974, Ser. No. 507,654
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46



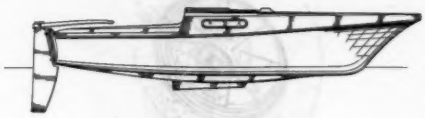
241,824
SMOKE ALARM
Frederick G. Mackay, Tarzana, Calif., assignor to Teledyne Water Pik, Fort Collins, Colo.
Filed Oct. 31, 1975, Ser. No. 627,710
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



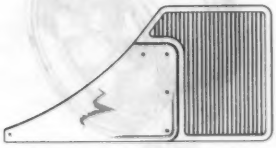
241,825
ALARM CABINET
J. Budd Steinhilber, Mill Valley, Calif., assignor to Optical Coating Laboratory, Inc.
Filed Dec. 12, 1975, Ser. No. 640,033
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



241,826
BOAT
William I. B. Crealock, 657 W. 19th St., Costa Mesa, Calif. 92627
Filed Jan. 19, 1973, Ser. No. 325,068
Term of patent 14 years
The term of this patent subsequent to Apr. 25, 1986, has been disclaimed
Int. Cl. D12—*06*
U.S. Cl. D12—64



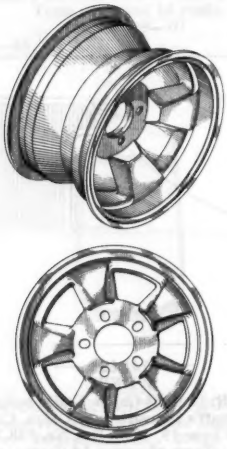
241,827
SPLASH GUARD FOR MOTOR VEHICLES
Robert Podall, Northbrook, Ill., assignor to Jeffrey Allan Industries, Inc., Evanston, Ill.
Filed Oct. 31, 1975, Ser. No. 627,507
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—185



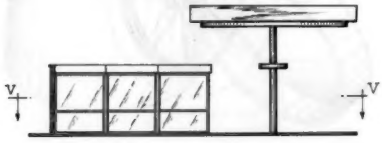
241,828
WHEEL
Marvin R. Hall, El Cajon, Calif., assignor to Hallcraft's Industries, El Cajon, Calif.
Filed June 19, 1975, Ser. No. 588,305
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205

241,829
WHEEL
Marvin R. Hall, El Cajon, Calif., assignor to Hallcraft's Industries, El Cajon, Calif.
Filed June 19, 1975, Ser. No. 588,304
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205

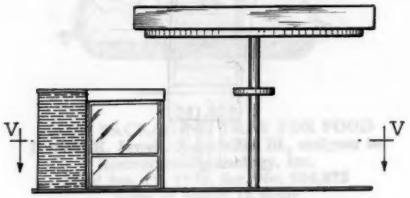
241,830
AUTOMOBILE WHEEL
Philip G. Patch, Laguna Beach, Calif., assignor to Keystone Products, Inc., Ontario, Calif.
Filed Jan. 8, 1976, Ser. No. 647,682
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



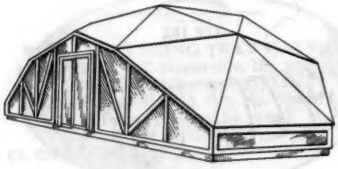
241,831
COMBINED SERVICE STATION AUXILIARY BUILDING AND CANOPY
Eliot F. Noyes, New Canaan, Conn., assignor to Mobil Oil Corporation
Filed June 10, 1974, Ser. No. 477,945
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—34



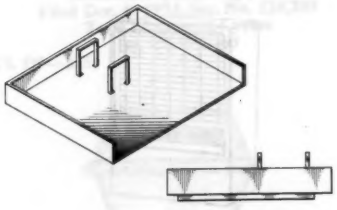
241,832
COMBINED SERVICE STATION AUXILIARY BUILDING AND CANOPY
Eliot F. Noyes, New Canaan, Conn., assignor to Mobil Oil Corporation
Filed June 10, 1974, Ser. No. 477,869
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—34



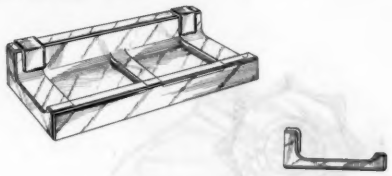
241,833
BUILDING STRUCTURE
Bernhoff A. Dahl, P.O. Box 164, Hampden Highlands, Maine 04445
Filed Jan. 20, 1975, Ser. No. 542,598
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—13



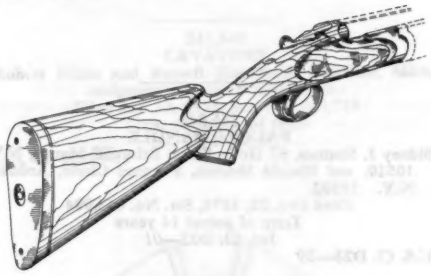
241,834
CALENDAR PAD HOLDER
Mel Evenson, Santa Monica, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed May 19, 1975, Ser. No. 578,495
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D19—20



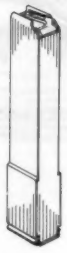
241,835
RACK FOR A GLASS CONTAINER
Guy Vrignaud, Grenoble, France, assignor to Allibert Exploitation Societe Anonyme, Puteaux, France
Filed Nov. 6, 1974, Ser. No. 521,495
Claims priority, application France May 6, 1974
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75



241,836
RECEIVER AND STOCK OF SHOTGUN
William B. Ruger, Southport, and Lawrence L. Larson, Bethany, Conn., assignors to Sturm, Ruger & Co. Inc., Southport, Conn.
Continuation-in-part of abandoned design application Ser. No. 521,879, Nov. 7, 1974. This application July 8, 1975, Ser. No. 594,101
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—6

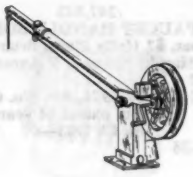


241,837
CARTRIDGE MAGAZINE
Jacob Sofinowski III, Baldwin, and Robert W. Schnepfe, Jr., Upperco, Md., assignors to AAI Corporation, Cockeysville, Md.
Filed Dec. 3, 1975, Ser. No. 637,348
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—7



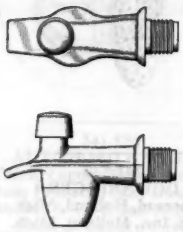
241,838
FISHING LURE SPOON
Benjamin Vanninen, Heinola, Finland, assignor to Rapala-Uistin, Lauri Rapala ja Pojat, Vaaksy, Finland
Filed Dec. 23, 1974, Ser. No. 535,729
Claims priority, application Finland June 26, 1974
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—29

241,839
DOWNRIGGER
James A. Kammeraad, Holland, Mich., assignor to DFK Inc., Holland, Mich.
Filed May 22, 1975, Ser. No. 579,890
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—26



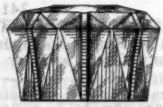
241,840
ARTIFICIAL FISHING WORM OR SIMILAR ARTICLE
Thomas J. Hanna, 685 Johnson Road, Jonesboro, Ga. 30236
Filed May 5, 1975, Ser. No. 574,736
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

241,841
FAUCET FOR USE IN WATER DISPENSERS
Carl E. Frahm and Shirley E. Frahm, both of 1428 Oak Meadow Road, Arcadia, Calif. 91006
Filed June 25, 1975, Ser. No. 590,251
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—23

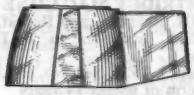


241,842
FAUCET HANDLE BODY
Sidney J. Shames, 57 Holly Place, Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Circle, Ardsley, N.Y. 10502
Filed Jan. 14, 1976, Ser. No. 649,038
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28

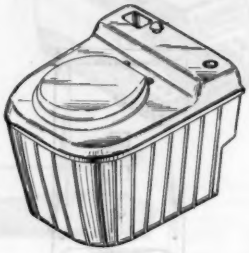
241,843
FAUCET HANDLE BODY
Sidney J. Shames, 57 Holly Place, Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Circle, Ardsley, N.Y. 10502
Filed Jan. 14, 1976, Ser. No. 649,039
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28



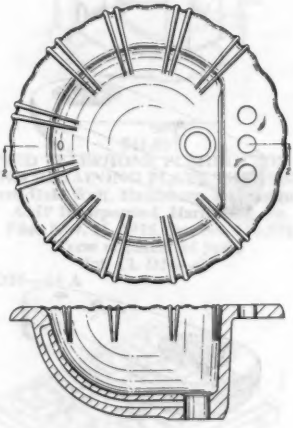
241,844
FAUCET HANDLE
Sidney J. Shames, 57 Holly Place, Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Circle, Ardsley, N.Y. 10502
Filed Dec. 22, 1975, Ser. No. 643,094
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—29



241,845
TOILET
Mohamed Shamsie, East Moline, Ill., assignor to Pure Way Corporation, East Moline, Ill.
Continuation-in-part of abandoned design application Ser. No. 491,352, July 24, 1974. This application Dec. 1, 1975, Ser. No. 636,797
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48



241,846
LAVATORY
Robert Ribits and Russell Blanchard, Marshall, Mich., assignors to Leigh Products, Inc.
Filed Jan. 13, 1975, Ser. No. 540,719
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58

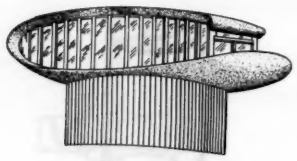


241,847
AIR FRESHENER DISPENSER
David A. Jones, Bellbrook, and Lemuel R. Burnet, Jr., Cincinnati, Ohio, assignors to The Drackett Company, Cincinnati, Ohio
Filed May 1, 1975, Ser. No. 573,504
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

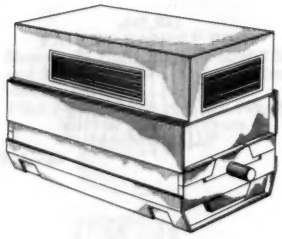
241,848
AIR FRESHENER OR SIMILAR ITEM
Georg Schimanski, Breckerfeld, Germany, assignor to Globol-Werk GmbH, Neuburg (Danube), Germany
Filed Apr. 29, 1975, Ser. No. 572,804
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

241,849
DENTAL FLOSS HOLDER
William Burnie Thomas, 1510 Duncan Way, Carrollton, Tex. 75006
Filed Jan. 27, 1975, Ser. No. 544,042
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—1 D

241,850
BUILDING
Jeffrey L. Wachter, Box 838, Bismarck, N. Dak. 58501
Filed Sept. 11, 1974, Ser. No. 504,866
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—18



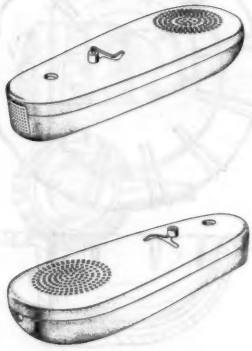
241,851
DYNAMOELECTRIC MACHINE
Robert G. Bartheld and Paul Diamant, Cincinnati, Ohio, assignors to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Mar. 7, 1975, Ser. No. 556,399
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D26—5 A



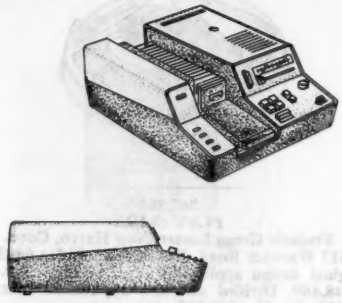
241,852
ELECTRONIC CALCULATOR
Norito Sugo, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Feb. 20, 1976, Ser. No. 659,712
Claims priority, application Japan Aug. 22, 1975
Term of patent 7 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

241,853
WALL SWITCH
Joel S. Spira, Allentown, Noel Mayo, Philadelphia, and Robert De Witt, Slatington, Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.
Filed Feb. 26, 1975, Ser. No. 553,320
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

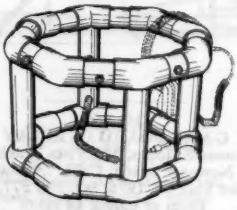
241,854
DICTATION MICROPHONE OR THE LIKE
Eliot F. Noyes, New Canaan, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 14, 1975, Ser. No. 558,518
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 J



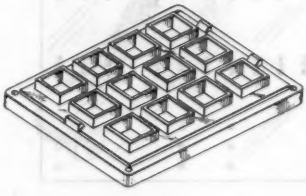
241,855
DICTATING MACHINE CONTAINING A CASSETTE CHANGER
Henricus Franciscus Theresia Schellens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 20, 1975, Ser. No. 560,163
Claims priority, application Switzerland Sept. 30, 1974
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B



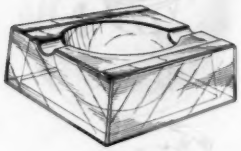
241,856
LISTENING CENTER
Jack H. Williams, 3229 W. Pioneer Drive, Irving, Tex. 75061
Filed Sept. 17, 1975, Ser. No. 614,212
Term of patent 14 years
Int. Cl. D14—*03;* D19—*07*
U.S. Cl. D26—14 G



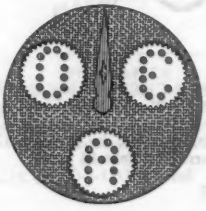
241,857
COMBINED TELEPHONE PUSHBUTTON SHIELD AND RETAINING PLATE THEREFOR
Lavern Dale Wulf, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Nov. 11, 1975, Ser. No. 630,858
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

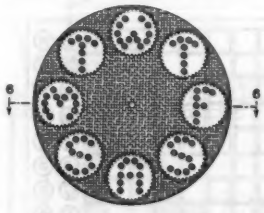


241,858
ASHTRAY
Guy Vrignaud, Grenoble, France, assignor to Allibert Exploitation Societe Anonyme, Puteaux, France
Filed Nov. 6, 1974, Ser. No. 521,496
Claims priority, application France May 6, 1974
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—29



241,859
INDICATOR OF ROOM OCCUPANCY
Nestor A. Kmicikewicz, 916 Cardero St., Vancouver 5, British Columbia, Canada
Filed June 19, 1975, Ser. No. 588,441
Claims priority, application Canada May 27, 1975; Great Britain June 7, 1975
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D96—12 R

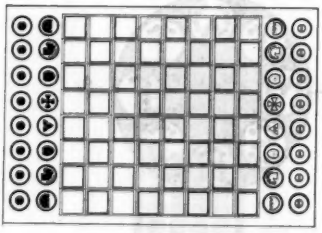




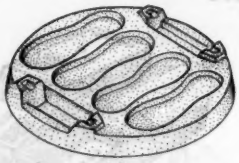
241,860
HUMMINGBIRD FEEDER
Rocco Calamia, La Mirada, Calif.
(930 S. Ajax Ave., City of Industry, Calif. 91744)
Filed Jan. 31, 1975, Ser. No. 545,820
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—15

241,861
NASO-GASTRIC TUBE RETAINER
Raymond H. Haerr, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio
Filed Feb. 28, 1975, Ser. No. 553,911
Term of patent 14 years
Int. Cl. D8—*08;* D24—*02, 04*
U.S. Cl. D32—1 R

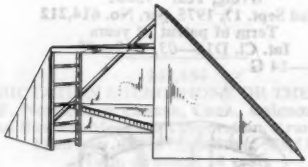
241,862
PEELABLE CHESS GAME CARD
Anthony J. Cioffi, 114 Branchport Ave., Long Branch, N.J. 07740
Filed Feb. 25, 1974, Ser. No. 445,124
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



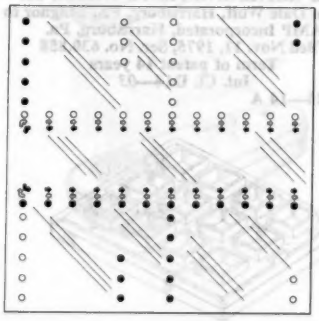
241,863
EXERCISING PLATFORM
Edward L. Friedl, Los Angeles, Calif.
(8406 Wilbur St., Northridge, Calif. 91324)
Filed Mar. 10, 1975, Ser. No. 556,817
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K



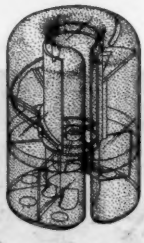
241,864
PLAY SLIDE
Frederic Gregg Loeser, New Haven, Conn.
(417 Warwick Road, Haddonfield, N.J. 08033)
Original design application Apr. 6, 1973, Ser. No. 348,469. Divided and this application Mar. 14, 1975, Ser. No. 558,225
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 E



241,865
GAME BOARD OVERLAY
James E. Jones, 305 Vista Trucha, Newport Beach, Calif. 92660
Filed May 14, 1975, Ser. No. 577,200
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



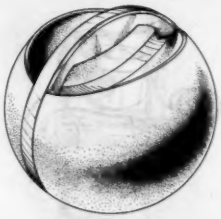
241,866
BANK
Sadayasu Miyazaki, 7–9–10 Tateishi, Katsushika-ku, Tokyo, Japan
Filed Jan. 6, 1975, Ser. No. 538,857
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D34—11 R



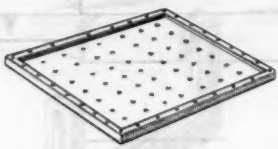
241,867
SKI
Rudolf Ferch, Salzburg, Austria, assignor to Kastle GmbH, Ried im Innkreis, Austria
Filed Jan. 9, 1975, Ser. No. 539,843
Claims priority, application Austria Nov. 19, 1974
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D

241,868
ROLLER SKATE
Ralph L. Smith, 1431 Ocean Ave., Santa Monica, Calif. 90401
Continuation-in-part of design application Ser. No. 458,196, Apr. 5, 1974, now Patent No. 236,741. This application Feb. 7, 1975, Ser. No. 547,763
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 C

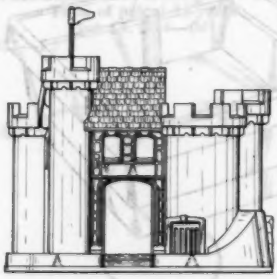
241,869
TOY BALL
Wilfried Hilprecht, Finspang, Sweden, assignor to Wilfried Hilprecht, Finspang, Sweden
Filed Oct. 26, 1973, Ser. No. 409,896
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 EE



241,870
JIG SAW PUZZLE BOARD
Charles L. Wallace, 11440 Court St., No. 1, Stanton, Calif. 90680
Filed Dec. 2, 1974, Ser. No. 528,702
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M



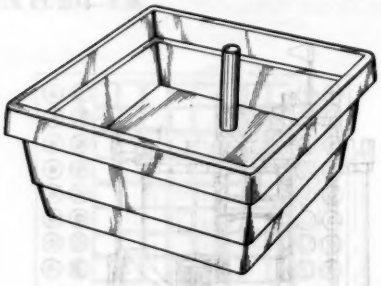
241,871
TOY CASTLE
Victor G. Reiling, Springfield, Mass., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 6, 1975, Ser. No. 538,530
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 CC



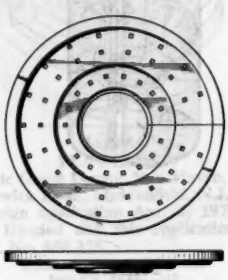
241,872
OCTOPUS ROLLER TOY
George W. Dunbar and Paul L. Lublus, Nashville, Tenn., assignors to Kusan, Inc., Nashville, Tenn.
Filed May 27, 1975, Ser. No. 579,042
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B

241,873
TOY LAUNCHER FOR AERIAL TOY
George W. Dunbar, Nashville, Tenn., and Jerry M. McAlpin, Bullard, and Richard L. Shirey, Jacksonville, Tex., assignors to Kusan, Inc., Nashville, Tenn.
Filed July 23, 1975, Ser. No. 596,562
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 PP

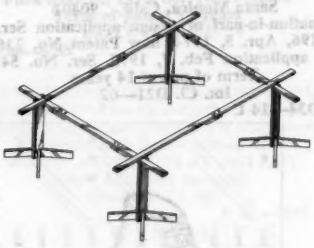
241,874
COMPOSITE, SELF-WATERING PLANT RECEPTACLE
Jan Berglund, Mulljo, Sweden, assignor to Sinjet AB, Huskvarna, Sweden
Filed Oct. 7, 1974, Ser. No. 512,950
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—156



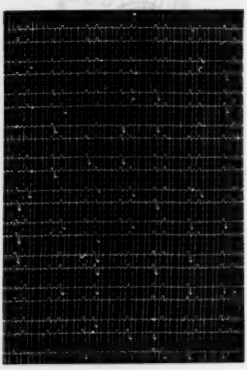
241,875
NURSERY POT COVER
Charles J. Insalaco, Pigeon Swamp Road, South Windham, Conn. 06266
Filed May 5, 1975, Ser. No. 575,447
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—164



241,876
QUILTING FRAME
Edward G. Bartling, 3879 Hallmark Drive, Granger, Utah 84119
Filed Mar. 3, 1975, Ser. No. 554,518
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—66



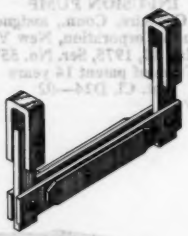
241,877
CURTAIN FABRIC
Peter E. Schroeder, Lucerne, Switzerland (Am Falter 8, Oberwil, near Brenngarten, Switzerland)
Filed Nov. 18, 1974, Ser. No. 524,934
Claims priority, application Germany May 25, 1974
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E



241,878
FRAMING MODULE FOR LIGHTING FOR CEILINGS OR SIMILAR ARTICLE
Stuart H. Manley, White Bear Lake, Minn., and William H. P. Tacke, Wyoming, Mich., assignors to Conwed Corporation, St. Paul, Minn.
Filed Aug. 6, 1973, Ser. No. 386,171
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—7 D

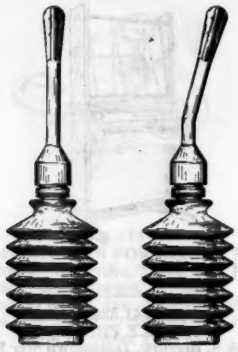
241,879
INFORMATION VENDING MACHINE
Wesley E. Swift, Sepulveda, Marc Schwartz, Sherman Oaks, and William D. Lewis, Pasadena, Calif., assignors to For-Play Manufacturers Corporation, Sun Valley, Calif.
Filed Nov. 4, 1974, Ser. No. 520,589
Term of patent 7 years
Int. Cl. D20—*01*
U.S. Cl. D52—3 R

241,880
AXLE PRESS
Frank S. Bigelow, Jamestown Star Rte., Boulder, Colo. 80302
Filed Oct. 2, 1975, Ser. No. 619,132
Term of patent 7 years
Int. Cl. D15—*99*
U.S. Cl. D15—123

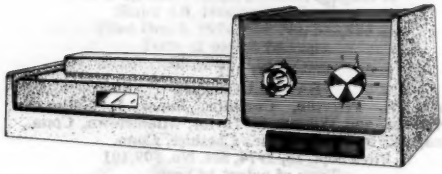


241,881
EAR PLUG UNIT
Robert M. Peterson, Cheshire, James J. Galluzzo, Meriden, and William S. Taylor, Middletown, Conn., assignors to Plasmed, Inc., Cheshire, Conn.
Filed Sept. 25, 1974, Ser. No. 509,101
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 J

241,882
DISPOSABLE FEMININE SYRINGE
James Robert Gross, Bensenville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed May 14, 1975, Ser. No. 577,255
Term of patent 14 years
Int. Cl. D24—*04, 99*
U.S. Cl. D83—1 Q



241,883
INFUSION PUMP
Phillip W. King, Cheshire, Conn., assignor to American Home Products Corporation, New York, N.Y.
Filed Mar. 12, 1975, Ser. No. 557,547
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F

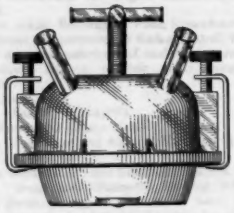


241,884
DISPOSABLE DOUCHE BOTTLE
James Robert Gross, Bensenville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed May 14, 1975, Ser. No. 577,531
Term of patent 14 years
Int. Cl. D24—*04, 99*
U.S. Cl. D83—1 Q

241,885
GYNECOLOGICAL EXAMINATION TABLE
Suzanne M. Portney, 98—41 Queens Blvd., Forest Hills, N.Y. 11374
Filed Apr. 14, 1975, Ser. No. 568,052
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—2 D

241,886
HAIR STYLIST'S HAIRCUTTING HELMET
Constantino J. Alevras, 542 Gruman Court, Rivervale, N.J. 07675
Filed Apr. 3, 1975, Ser. No. 564,915
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 A

241,887
MILKING APPARATUS
Robert J. Shulick, St. Charles, Ill., assignor to Babson Bros. Co., Oak Brook, Ill.
Filed June 13, 1975, Ser. No. 587,214
Term of patent 14 years
Int. Cl. D15—*03;* D30—*99*
U.S. Cl. D30—99



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF OCTOBER, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Machine Company: *See—*
Boberg, Jarl A., 3,985,180.

A/S Fredrikstad mek. Verksted: *See—*
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A-Z International Tool Company: *See—*
Kagler, Edmond, Jr., 3,984,991.

AB Akerlund & Rausing: *See—*
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AB ASSA: *See—*
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AB Bofors: *See—*
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AB Ziristor: *See—*
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Abbe, Motoko: *See—*
Abbe, Ryonosuke; and Abbe, Motoko, 3,985,536.

Abbe, Ryonosuke; and Abbe, Motoko. Method for the preparation of an organic soil conditioner from peat-moss. 3,985,536, Cl. 71-24.000.

Abcor, Inc.: *See—*
Goldsmith, Robert L., 3,985,017.

Abe, Hajime: *See—*
Yamaji, Kenkichi; Oelhschlagel, Dietrich; and Abe, Hajime, 3,985,280.

Abela, Alexander A.: *See—*
Caffo, John A.; Abela, Alexander A.; Ledbetter, Theodore N.; and Joubert, Darrell W., 3,986,129.

Ablassmeier, Ulrich, to Siemens Aktiengesellschaft. Charge coupled transfer arrangement in which majority carriers are used for the charge transfer. 3,986,197, Cl. 357-24.000.

Accurate Machine and Engineering Co.: *See—*
Parker, Alexander Lovell, 3,985,312.

ACF Industries, Incorporated: *See—*
Sitton, Willard J., 3,985,097.

Achener, Pierre Y.; Boehme, Detlef R.; and Judah, Kenneth C., to Varian Associates. High performance liquid chromatography system. 3,985,021, Cl. 73-61.10C.

Ackermann, Carl A.; and McPherson, Patrick F., to Blu-Ray, Incorporated. Apparatus for developing diazo type film. 3,986,191, Cl. 354-299.000.

Ackley, George Nelson, to AMP Incorporated. Stator terminal assembly machine. 3,984,908, Cl. 29-205.00D.

Acushnet Company: *See—*
Jepson, John W.; Reid, Walter; and Brown, Robert A., 3,985,363.

Adachi, Akira: *See—*
Oda, Noriyuki; Yoshida, Takashi; Nakanishi, Takeshi; Yoshikawa, Kensuke; Adachi, Akira; Ueda, Jitsuhiko; and Mizota, Toshihiro, 3,985,866.

Adam, Helmut; Lutz, Hans; and Siegle, Gert, to Robert Bosch G.m.b.H. Apparatus for concurrently sputtering different materials. 3,985,635, Cl. 204-298.000.

Adams, Richard Leighton: *See—*
Witherspoon, Romeo Richard; and Adams, Richard Leighton, 3,985,578.

Adams, William Charles. Unitary drier. 3,984,921, Cl. 34-243.00C.

Adamski, Alfred, to Zenith Radio Corporation. Color cathode ray tube having an improved shadow mask suspension system. 3,986,072, Cl. 313-404.000.

Addressograph Multigraph Corporation: *See—*
Hou, Shou L.; and Taucher, Kenneth F., 3,985,432.

ADE Corporation: *See—*
Poduje, Noel S., 3,986,109.

Adler, Robert, to Zenith Radio Corporation. Elasto-optic device for spot wobble in a video disc player. 3,985,952, Cl. 178-6.60R.

Advanced Micro Devices, Inc.: *See—*
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AEG-Telefunken-Teldec: *See—*
Borchard, Heinz; Kasch, Robert; Rybka, Bruno; and Knothe, Herbert, 3,985,521.

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AGA Aktiebolag: *See—*
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Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
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De Haes, Louis Maria; Vermeulen, Leon Louis; Gevers, Hugo Karel; Bongaerts, Stephan Jeanne; Van Pee, Paul Desire; and Krafft, Werner, 3,985,561.
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Van Biesen, Jozef Antoon; and Palmans, Willy Joseph, 3,986,189.

Ahlgren, Nils Harald. Rotary apparatus adapted to bring at least two media of different weight into alternate contact with the apparatus surfaces. 3,985,653, Cl. 210-150.000.

Ahola, Jacob W.; and Rendfeld, Fred A., to Caterpillar Tractor Co. Slip joint connection for engine exhaust system. 3,985,377, Cl. 285-9.00R.

Aignesberger, Alois; Bornmann, Paul; Rosenbauer, Hans-Gunter; and Theissig, Hans, to Suddeutsche Kalkstickstoff-Werke AG. Process of preparing aqueous solutions of melamine-formaldehyde condensation products having anionic sulfo groups. 3,985,696, Cl. 260-29.40R.

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Aisin Seiki Kabushiki Kaisha: *See—*
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Akatsuka, Takeaki; Kitagawa, Katsuichi; Amo, Hiroyoshi; and Mita, Osamu, to Toray Industries, Inc. Method for controlling the gap between lips of a die for extruding a plastic sheet material. 3,985,845, Cl. 264-40.500.

Aker, Ludwig E.; and Skanes, Frederick A., to International Harvester Company. Quick change attachment. 3,985,249, Cl. 214-145.00A.

Akimoto, Masao: *See—*
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Akre, Ivar J. Winch-type tensioning device. 3,985,341, Cl. 254-161.000.

Aktiebolaget Electrolux: *See—*
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Akzona Incorporated: *See—*
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Albach, William N., to Lawrence Peska Associates, Inc., a part interest. Disposable shaving kit. 3,985,146, Cl. 132-79.00B.

Albanese, Thomas. Under fixture valve. 3,985,152, Cl. 137-360.000.

Alberti, Giulio; and Costantino, Umberto, to Comitate Nazionale per l'Energia Nucleare. Wholly inoganic papers and membranes suitable for ion exchange made of thorium acid phosphate and process for preparing the same. 3,985,611, Cl. 162-157.00R.

Albrecht, Paul, to W. Albrecht KG. Miniature indicating lamp. 3,986,068, Cl. 313-318.000.

Albright, Charles W.; and Keller, George E., II, to Union Carbide Corporation. Cracking process. 3,985,820, Cl. 260-683.00R.

Alcan Research and Development Limited: *See—*
Wilson, Wayne Richard; and Kirkpatrick, William James, 3,985,279.

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Choby, Edward G., Jr., 3,985,587.

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Allen, Richard Michael, to Electronic Chassis Corporation. Carrier for skis and ski poles. 3,985,275, Cl. 224-45.00S.

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Booth, Frederick C., 3,985,314.
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Allis-Chalmers Corporation: *See—*
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Patel, Amrut R., 3,985,987.

Allison, David F., to Signetics Corporation. Semiconductor structure and method. 3,986,200, Cl. 357-55.000.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
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Alps Motorola, Inc.: *See—*
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Alt, Gerhard H.; and Franz, John E., to Monsanto Company. Plant growth regulators. 3,985,773, Cl. 260-343.30R.

Altair Industries, Inc.: *See—*
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Alvan, George E.; and Holstius, Elvin A., to Burroughs Wellcome Co. Solution containing trimethoprim, sulfacetamide and polymyxin. 3,985,873, Cl. 424-177.000.

Amada Company Limited: *See—*
Oseto, Moichi, 3,985,056.

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American Air Filter Company, Inc.: *See—*
Revell, Alan E., 3,985,528.

American Chain & Cable Company, Inc.: *See—*
Gilmore, William J., 3,985,041.

American Cyanamid Company: *See—*
Chang, Eugene Yue Chieh; and Saxon, Robert, 3,985,708.
Conrow, Ransom Brown; and Bernstein, Seymour, 3,985,884.
Corey, Howard Seebree, Jr.; Barringer, William Charles; and Hansen, Lloyd Frank, 3,985,868.
Floyd, Middleton Brawner, Jr.; and Weiss, Martin Joseph, 3,985,798.
Hofmann, Corris Mabelle; and Safir, Sidney Robert, 3,985,754.
Lucas, Howard Robert, 3,985,828.
Wright, William Blythe, Jr., 3,985,732.

American Hoechst Corporation: *See—*
Bauer, Victor J.; and Kosley, Raymond W., Jr., 3,985,889.

American Home Products Corporation: *See—*
Schilling, Guenther; and Dobson, Thomas A., 3,985,774.

American Optical Corporation: *See—*
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Amo, Hiroyoshi: *See—*
Akatsuka, Takeaki; Kitagawa, Katsuichi; Amo, Hiroyoshi; and Mita, Osamu, 3,985,845.

Amot Controls Corporation: *See—*
Gripe, William B.; and Norman, Melvin H., 3,985,337.

AMP Incorporated: *See—*
Ackley, George Nelson, 3,984,908.
Dola, Frank Peter; and Rossler, Frederick William, Jr., 3,985,416.
Evans, William Robert, 3,985,413.

AMT Corporation: *See—*
Bergmann, Henry F.; and Oswald, Bernard J., 3,985,392.

Anderson, Alfred T., to NCR Corporation. Multichannel error signal generator. 3,986,168, Cl. 340-146.1AX.

Anderson, Donald R.: *See—*
Trenda, Dorn D.; and Anderson, Donald R., 3,985,598.

Anderson, James E.: *See—*
Balch, James L.; Anderson, James E.; and Sadeski, Boleslaus J., 3,985,052.

Anderson, John Erling, to Union Carbide Corporation. Oxygen refuse converter. 3,985,518, Cl. 48-111.000.

Anderson, Perry W.: *See—*
Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, 3,985,912.

Anderson, Robert L.: *See—*
King, Robert W.; and Anderson, Robert L., 3,985,473.

Andreiko, Craig A.: *See—*
Miller, Frank R.; and Andreiko, Craig A., 3,985,282.

Angadiyavar, Channabasappa S.; and Srinivasan, Rangaswamy, to International Business Machines Corporation. 2,4,6 Trisubstituted pyridine dye lasers. 3,986,140, Cl. 331-94.50L.

Angel, Richard G.: *See—*
Narayanan, Venkatachala Lakshmi; and Angel, Richard G., 3,985,885.

Angelico, Henry R.: *See—*
Johnston, James J.; Angelico, Henry R.; Bedard, Walter J.; and Ruggiero, Joseph E., 3,984,912.

Anthes, John A.: *See—*
Vlnaty, Joseph; Snyder, George A.; and Anthes, John A., 3,985,543.

Antrim, Warren W.; Baynes, Gene P.; Downs, Thomas C.; and Enghauser, James E., to General Motors Corporation. Tube core apex seal for rotary combustion engine. 3,985,477, Cl. 418-122.000.

Aoki, Hidekazu: *See—*
Kojima, Chiaki; Ohta, Hiroshi; and Aoki, Hidekazu, 3,985,390.

Applied Power Inc.: *See—*
Knutson, Dale A., 3,985,194.

Aqua-Chem, Inc.: *See—*
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Arai, Hiroshi: *See—*
Wakamatsu, Hisato; Kamiya, Toshihiro; Yoshimi, Tomohisa; and Arai, Hiroshi, 3,986,093.

Arai, Michio, to Sony Corporation. Light responsive field effect transistor having a pair of gate regions. 3,986,195, Cl. 307-304.000.

Arai, Takeshi, to Sanyo Electric Co., Ltd. Vertical deflection circuit. 3,986,077, Cl. 315-389.000.

Araki, Tsunehiko: *See—*
Nakano, Takeshi; Kurata, Kunisige; Okuda, Yoshihiko; and Araki, Tsunehiko, 3,985,453.

Arey, William F., Jr.; Hamner, Glen P.; and Sawyer, Willard H., to Exxon Research and Engineering Company. Heavy crude conversion. 3,985,684, Cl. 252-469.000.

Argurio, Federico; Borsatti, Mario; and Heindrijckx, Jan, to Exxon Research and Engineering Company. Self-sealing films comprising a polyolefin and a partial ester of a carboxylic acid and a polyol. 3,985,833, Cl. 260-897.00R.

Arita, Shigeru, to Matsushita Electronics Corporation. Method of manufacturing parallel gate matrix circuits. 3,985,591, Cl. 148-187.000.

Armco Steel Corporation: *See—*
Eidem, Brian L., 3,985,093.

Armstrong Cork Company: *See—*
Kauffman, William J., 3,985,748.
Wasson, Kenneth L., 3,984,959.
Yacono, Anthony J., 3,985,089.

Arrow Vale Egg Producers Limited: *See—*
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Artiloc U.S.A. Inc.: *See—*
O'Leary, William, 3,985,369.

Artisan Industries Inc.: *See—*
Baird, James L.; and Mendelsohn, Max, 3,985,606.

Artz, Klaus, to Ciba-Geigy AG. Benzisothiazole and indazole azo compounds. 3,985,726, Cl. 260-162.000.

Arvanitakis, Kostas Savas. Filter cleaning apparatus. 3,985,656, Cl. 210-327.000.

Asano, Shiro: *See—*
Hashimoto, Nobuyoshi; Yoshimura, Kiyotaka; Asano, Shiro; Honda, Tadatoshi; and Tsuchiya, Ryozi, 3,985,806.

Ashland Oil, Inc.: *See—*
Grimm, Robert A.; Portwood, Owen; Sedor, Edward A.; and Williams, Jeannene A., 3,985,807.

Ashley, Marion L. Vacuum sweeper device. 3,984,893, Cl. 15-339.000.

Ashton, Stanley; Laithwaite, Peter; and Taylor, John Anthony, to Imperial Chemical Industries Limited. Vulcanizable rubber compositions comprising organic derivatives of hydrazine. 3,985,717, Cl. 260-79.50R.

Aspnes, David Erik, to Bell Telephone Laboratories, Incorporated. Measurement of thin films by polarized light. 3,985,447, Cl. 356-118.000.

Association du Centre de Transfusion Sanguine et de Dessiccation du Plasma: *See—*
Guimbretiere, Jean Gerard, 3,985,096.

Asturiana de Zinc, S.A.: *See—*
Menendez, Francisco Javier Sitges; and Fernandez, Vicente Arregui, 3,985,857.

Atlantic Richfield Company: *See—*
Frisch, Kurt C.; Reegen, Sidney L.; and Bauer, Harry L., 3,985,713.
Miller, Gary E., 3,985,514.

Atlas Powder Company: *See—*
Machacek, Oldrich, 3,985,593.

Atomic Energy of Canada Limited: *See—*
Ip, Anthony K. C.; and Koyanagi, Kenneth, 3,985,989.

Aubey, Rolland A.: *See—*
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Auerbach, Melvin: *See—*
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Augart, Dietmar: *See—*
Scheuermann, Horst; and Augart, Dietmar, 3,985,772.

August Sauter GmbH: *See—*
Kammerer, Manfred; and Tikart, Johann, 3,985,190.

August Thyssen-Hutte Aktienges.: *See—*
Brandi, Hermann Th., deceased; and Luckow, Herbert, 3,985,995.

Austel, Volkhard: *See—*
Kutter, Eberhard; Austel, Volkhard; and Diederen, Willi, 3,985,891.

Automated Building Components, Inc.: *See—*
Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, 3,985,278.

Automated Energy Systems, Inc.: *See—*
Brunette, Norman R., 3,986,013.

Automatic Equipment Development Corporation: *See—*
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Automation Industries, Inc.: *See—*
Turner, William R., 3,986,160.

Automobiles Peugeot: *See—*
Gallinato-Contino, Roland, 3,985,403.
Tixier, Michel, 3,985,195.

Avakian, Souren, to Centaur Chemical Co. Micropipette filter tips. 3,985,032, Cl. 73-425.40P.

Avco Corporation: *See—*
Krukonis, Val J., 3,985,917.

Avco Everett Research Laboratory, Inc.: *See—*
Herzlinger, George A.; Federico, Armando; and Kantrowitz, Arthur R., 3,985,123.

Ayerst McKenna and Harrison Ltd.: *See—*
Bruderlein, Francois T.; and Humber, Leslie G., 3,985,751.

B. F. Goodrich Company, The: *See—*
Taylor, Ray D., 3,985,743.

Babinsky, Andrew D.: *See—*
Hora, Charles J.; and Babinsky, Andrew D., 3,985,631.

Bach, Nicholas J.: *See—*
Kornfeld, Edmund C.; and Bach, Nicholas J., 3,985,752.

Badger Dynamics, Inc.: *See—*
Liegel, Reinald D.; and Hummel, Richard J., 3,985,248.

Badrian, Willy H. J.: *See—*
Mehta, Hemant; and Badrian, Willy H. J., 3,985,933.

Bagley, Edward B.: *See—*
Weaver, Mary Ollidene; Bagley, Edward B.; Fanta, George F.; and Doane, William M., 3,985,616.

Bailey, Denis M., to Sterling Drug Inc. 4,5-Dihalopyrrole-2-carbonitrile-containing terrestrial and aquatic hebicidal composition. 3,985,539, Cl. 71-66.000.

Baird, George Charles, to Seismograph Service Corporation. Apparatus for timing the firing of energy sources. 3,985,199, Cl. 181-107.000.

Baird, James L.; and Mendelsohn, Max, to Artisan Industries Inc. Low-pressure deentrainment evaporator. 3,985,606, Cl. 159-6.0WH.

Baitinger, Utz; Najmann, Knut K.; and Haug, Werner, to International Business Machines Corporation. Memory circuit. 3,986,173, Cl. 340-173.00R.

Balch, James L.; Anderson, James E.; and Sadeski, Boleslaus J., to Oscar Mayer & Co. Inc. Conveyor loading system. 3,985,052, Cl. 83-69.000.

Baldwin, Stephen George: *See—*
Bradford, Christopher William; and Baldwin, Stephen George, 3,985,854.

Balla, Gyula, to Deering Milliken Research Corporation. Method for the manufacture of laminated packing material containing metal foil. 3,985,604, Cl. 156-244.000.

Ballantyne, David B., to General Motors Corporation. Panel extruding nut and assembly. 3,985,172, Cl. 151-41.730.

Bandoh, Tadaaki: *See—*
Kobayashi, Yoshiki; Bandoh, Tadaaki; Ide, Jushi; and Kamiuchi, Toshiro, 3,986,169.

Banerjea, Tara N.: *See—*
Chieger, George; and Banerjea, Tara N., 3,984,961.

Barac, Dragoje R. Electric walker. 3,985,082, Cl. 104-89.000.

Barber-Colman Company: *See—*
Kulczycki, Karol; and Darsie, Burns, 3,985,160.
Townsend, Franklin L.; and Trumpio, Frank P., 3,985,159.

Barbieri, Siegfried; and Obertegger, Franz, to Durst AG Fabrik Fototechnischer Apparate. Color filter determining apparatus with indication of the color components to be balanced. 3,985,450, Cl. 356-175.000.

Bard, Robert F. Solar furnace. 3,985,118, Cl. 126-271.000.

Bardeau, William Milton; and Welty, Frank. Automatic liquid dispensing apparatus. 3,985,269, Cl. 222-145.000.

Barden, Allan D.: *See—*
Selvia, Ray E.; and Barden, Allan D., 3,985,267.

Bardic Engineering Limited: *See—*
Bonfield, Robert B., 3,985,389.

Barient Company: *See—*
Guangorena, Jesus, 3,985,340.

Barkalow, Clare E., to Michigan Instruments, Inc. Patient retention and support. 3,985,126, Cl. 128-53.000.

Baron, George B., to Marion Power Shovel Company, Inc. Cushioned roller circle. 3,985,406, Cl. 308-219.000.

Barr, Thomas A., Jr.: *See—*
Ehrlich, John J.; and Barr, Thomas A., Jr., 3,986,137.

Barrat, Christian, to Procter & Gamble Company, The. Detergent compositions containing enzymes. 3,985,686, Cl. 252-547.000.

Barrera, Roberto Gonzales: *See—*
Longenecker, John G.; Rubio, Manuel J.; and Robustelli, Ciro M., 3,985,070.

Barringer, Anthony Rene, to Barringer Research Limited. Exploration method and apparatus utilizing atmospheric micro-organic particulates. 3,985,619, Cl. 195-103.50R.

Barringer Research Limited: *See—*
Barringer, Anthony Rene, 3,985,619.

Barringer, William Charles: *See—*
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Barry Wright Corporation: *See—*
Frochaux, Alain, 3,985,302.

Barton, George G.: *See—*
Feldman, Sidney; and Barton, George G., 3,985,446.

Barzely, Avner, to Kunik, I. Jordan, a part interest. Voltage-frequency and frequency-voltage reciprocal converter. 3,986,055, Cl. 307-271.000.

Basadur, Marino S., to Procter & Gamble Company, The. Process for imparting renewable soil release finish to polyester-containing fabrics. 3,985,923, Cl. 427-390.00E.

BASF Aktiengesellschaft: *See—*
Baumann, Hans; and Oberlinner, Andreas, 3,985,376.
Fischer, Adolf, 3,985,542.
Kindscher, Wolfgang; and Oppenlaender, Knut, 3,985,504.
Scheuermann, Horst; and Augart, Dietmar, 3,985,772.

Batzer, Hans: *See—*
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Baudry, Etienne: *See—*
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Bauer, Donald J.: *See—*
Haskett, Philip R.; Bauer, Donald J.; Elges, Carl H., III; and Lindstrom, Roald E., 3,985,855.

Bauer, Harry L.: *See—*
Frisch, Kurt C.; Reegen, Sidney L.; and Bauer, Harry L., 3,985,713.

Bauer, Victor J.; and Kosley, Raymond W., Jr., to American Hoechst Corporation. Method of tranquilizing and treating pain. 3,985,889, Cl. 424-267.000.

Baum, Sergei Alexeevich; Meshkov, Nikolai Mikhailovich; Nikolaev, Mikhail Georgievich; Osipov, Evgeny Yakovlevich; Khaikin, Boris Alexandrovich; and Dymov, Gershon Davidovich. Chain conveyor with support chain. 3,985,225, Cl. 198-834.000.

Baumann, Hans; and Oberlinner, Andreas, to BASF Aktiengesellschaft. Dye precursors for pressure-sensitive recording material. 3,985,376, Cl. 282-27.500.

Baxter, Charles A.: *See—*
Samuelson, Donald G.; and Baxter, Charles A., 3,985,192.

Baxter Laboratories, Inc.: *See—*
Carpenter, Walter L.; and Leonard, Ronald J., 3,985,135.

Bayer Aktiengesellschaft: *See—*
Harnisch, Horst, 3,985,763.
Hocker, Jurgen; Diehr, Hans-Joachim; and Merten, Rudolf, 3,985,789.
Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, 3,985,874.
Meyer, Horst; Bossert, Freidrich; Vater, Wulf; and Stoepel, Kurt, 3,985,886.
Regel, Erik; Buchel, Karl Heinz; and Plempel, Manfred, 3,985,766.
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,985,879.
Vogel, Axel, 3,985,778.
von Bonin, Wulf; and Streigler, Helmut, 3,985,929.

Baynes, Gene P.: *See—*
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BBC Brown Boveri & Cie AG: *See—*
Korner, Gerhard; and Schmitz, Wolfgang, 3,985,988.

BBC Brown Boveri & Company Limited: *See—*
Milliquet, Vladimir, 3,986,135.

Beaty, David W.; and Severson, Gerald R., to Motorola, Inc. Receiver system for receiving audio electrical signals. 3,985,977, Cl. 179-82.000.

Beck, William H.; and Huggett, Colin E., to Garrett Corporation, The. Multi-purpose thyristor commutation circuit. 3,986,099, Cl. 321-45.00C.

Becker, Karl Heinz: *See—*
Mehrhof, Werner; Pohlke, Rolf; Becker, Karl Heinz; and Schliep, Hans-Jochen, 3,985,881.

Becking, Donald Harvey, to Oxy Metal Industries Corporation. Production of anisaldehyde. 3,985,809, Cl. 260-600.00R.

Becking, Donald Harvey: *See—*
Clauss, Richard John; Tremmel, Robert Arnold; and Becking, Donald Harvey, 3,985,784.

Beckmann, Oskar, to Siemens Aktiengesellschaft. Firing arrangement for a number of electric valves, particularly of thyristors. 3,986,050, Cl. 307-252.00L.

Bedard, Walter J.: *See—*
Johnston, James J.; Angelico, Henry R.; Bedard, Walter J.; and Ruggiero, Joseph E., 3,984,912.

Beecher, William J. Binocular having small size, lightweight, and high performance characteristic. 3,985,421, Cl. 350-36.000.

Beecroft, Harold James; Burniece, Thomas Francis, III; and Hennenfent, Douglas Joseph, to Control Data Corporation. Magnetic read head with offset flux gaps. 3,986,209, Cl. 360-121.000.

Behringwerke Aktiengesellschaft: *See—*
Karges, Hermann Erich, 3,985,620.

Beierholm, Hans Mogens; and Henriksen, Niels Juul, to Danfoss A/S. DC-voltage supply means for an inverter. 3,986,100, Cl. 323-17.000.

Bell, Richard L., to Container Corporation of America. Compartmented carton. 3,985,288, Cl. 229-38.000.

Bell Telephone Laboratories, Incorporated: *See—*
Aspnes, David Erik, 3,985,447.
Colton, John Robert; Heick, Robert Bruce; and Mann, Henry, 3,985,967.
DiLorenzo, James Vincent; Niehaus, William Charles; and Varnerin, Lawrence John, Jr., 3,986,192.
Dudley, Homer W., 3,985,958.
Kogelnik, Herwig Werner, 3,986,020.
Mohsen, Amr Mohamed, 3,986,059.
Ross, David Gene; and Schnitzler, Paul, 3,986,131.
Shea, Donald Ray, 3,985,973.
Thomas, Edwin Paul, 3,986,108.
Wallace, Robert Lee, Jr., 3,985,960.
Woods, Gordon Douglas, 3,986,097.

Belokin, Paul, Jr. Illuminated overhead advertising display. 3,984,931, Cl. 40-130.00C.

Bender, John F.: *See—*
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Bendix Corporation, The: *See—*
Better, Bernard R.; and Hain, Edward, 3,985,368.
Hall, John L.; and Pataky, Gilbert A., 3,985,214.
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Bennes Marrel, Zone Industrielle: *See—*
Guillot, Jack, 3,985,181.

Bennett, Roswell J.: *See—*
Johnson, Daniel H.; Kubala, David M.; and Bennett, Roswell J., 3,985,573.

Bennett, Russell B.; Campbell, Clair E.; and Pritz, Howard B., to Smith-Kline Corporation. Method of making glass ampul for jet injector. 3,985,535, Cl. 65-61.000.

Bentley, Clarence. Drip irrigation valve. 3,985,336, Cl. 251-205.000.

Benziger, Theodore M., to United States of America, Energy Research and Development Administration. Insensitive explosive composition of halogenated copolymer and triaminotrinitrobenzene. 3,985,595, Cl. 149-19.300.

Benzon-Petersen, Boye, to AB Akerlund & Rausing. Carrying bag. 3,985,291, Cl. 229-54.00R.

Berg, Markus; Hoffmeister, Jurgen; Jakobi, Gunter; and Krings, Peter, to Henkel & Cie G.m.b.H. Liquid regulated-foam detergent compositions. 3,985,670, Cl. 252-117.000.

Bergmann, Henry F.; and Oswald, Bernard J., to AMT Corporation. Vehicle wheel assembly for a toy vehicle. 3,985,392, Cl. 301-63.0PW.

Berner, George J., to Hobart Corporation. Method and apparatus for transportation of a label. 3,985,603, Cl. 156-235.000.

Berner, Klaus: *See—*
Rheinlander, Paul; Mahn, Gustav; Berner, Klaus; Schulz, Klaus, deceased; and Ruhland, Ingrid, legal representative, 3,985,549.

Bernhard, Nils Gunnar: *See—*
Wiklund, Klas Rudolf; Bernhard, Nils Gunnar; and Kleinhuber, Harald, 3,985,448.

Bernotavicz, John W., to Quaker Oats Company, The. Shelf stable, high moisture, meat-containing food product. 3,985,904, Cl. 426-332.000.

Bernstein, Jack: *See—*
Koster, William Henry; Slusarchyk, William A.; and Bernstein, Jack, 3,985,746.

Bernstein, Seymour: *See—*
Conrow, Ransom Brown; and Bernstein, Seymour, 3,985,884.

Bettcher Industries, Inc.: *See—*
Bettcher, Louis A., 3,985,057.

Bettcher, Louis A., to Bettcher Industries, Inc. Comestible slicing apparatus. 3,985,057, Cl. 83-703.000.

Better, Bernard R.; and Hain, Edward, to Bendix Corporation, The. Quick-change spindle nose adapter. 3,985,368, Cl. 279-75.000.

Betts, Paul J., to Inter Dyne. Constant temperature bath for laboratory use. 3,985,511, Cl. 23-292.000.

Beyn, Edgar J.: *See—*
Johnson, Lawrence A.; and Beyn, Edgar J., 3,985,913.

Bi, Le-Khac: *See—*
Fetters, Lewis J.; and Bi, Le-Khac, 3,985,830.

Bibring, Herve; Trottier, Jean-Pierre; Khan, Tasadduq; Stohr, Jean-Francois; and Rabinovitch, Maurice, to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.). Process for the improvement of refractory composite materials comprising a matrix consisting of a superalloy and reinforcing fibers consisting of a metal carbide. 3,985,582, Cl. 148-3.000.

Bierlein, John C.; and Shipek, Edward J., to General Motors Corporation. Bearing having iron sulfur matrix. 3,985,408, Cl. 308-237.00R.

Bilen, Lennart: *See—*
Poole, John S.; Muhlestein, H. Blair; Smith, Douglas H.; and Bilen, Lennart, 3,986,011.

Bing, Charles W.: *See—*
Corrado, Anthony P.; Timte, Frank; Rakowsky, Edward L.; Marchese, Vincent P.; and Bing, Charles W., 3,985,058.

Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, to Hoechst Aktiengesellschaft. Process and device for drying chemical products. 3,985,498, Cl. 432-136.000.

Bison-werke Bahre & Greten GmbH & Co. KG: *See—*
de Mets, Albert, 3,985,489.

Bjerg, Miguel J. Fernandez. Alcoholic beverage still with domed conduits for vapor flow and frustum apertures for concurrent vapor/liquid flow. 3,985,625, Cl. 202-158.000.

Bjorn, Lars-Erik, to AB Bofors. Method of reducing the muzzle flash when firing firearms loaded with powder, and powder flash-reducing agent intended for this purpose. 3,985,594, Cl. 149-108.400.

Bjorshol, Oyvind Ottar, to P. Bjorshol Mek. Verksted. Trawl winch. 3,985,339, Cl. 254-137.000.

Blackwelder, Maurice W., to Owens-Illinois, Inc. Method for the cooling of a tubular extrudate of expanded polystyrene. 3,985,931, Cl. 428-315.000.

Blaine, Louis L., to Ecodyne Corporation. Vacuum stripping of ammonia. 3,985,859, Cl. 423-238.000.

Blair, Richard L. Bottle cap. 3,985,255, Cl. 215-254.000.

Blais, Leo, to Consolidated-Bathurst Limited. Method for slitting a film. 3,985,600, Cl. 156-229.000.

Blakemore, Bernard: *See—*
Sword, Geoffrey; Lawrence, John Leslie; Raggett, Stephen Richard; and Blakemore, Bernard, 3,986,089.

Blass, Gerhard; and Disl, Johann, to Siemens Aktiengesellschaft. Apparatus for measuring the distortion of data signals. 3,985,955, Cl. 178-69.00A.

Blau KG Fabrik fur Kraftfahrzeugteile: *See—*
Gerdes, Theo, 3,985,007.

Blomgren, Steven, to Monroe Auto Equipment Company. Loading dock support. 3,984,889, Cl. 14-71.700.

Blu-Ray, Incorporated: *See—*
Ackermann, Carl A.; and McPherson, Patrick F., 3,986,191.

Boberg, Jarl A., to A. B. Machine Company. Lead weight-making apparatus. 3,985,180, Cl. 164-332.000.

Boehme, Detlef R.; Judah, Kenneth C.; and Munk, Miner N. Liquid chromatography system with solvent proportioning. 3,985,019, Cl. 73-61.10C.

Boehme, Detlef R.: *See—*
Achener, Pierre Y.; Boehme, Detlef R.; and Judah, Kenneth C., 3,985,021.

Boehringer Ingelheim GmbH: *See—*
Kutter, Eberhard; Austel, Volkhard; and Diederen, Willi, 3,985,891.

Boeing Company, The: *See—*
Dean, Roy Delmar; and Weiland, Richard Herschel, 3,985,319.

Boliden Aktiebolag: *See—*
Petersson, Stig Arvid, 3,985,529.

Bommart, Patrick T. Overhead rigid power conductor. 3,985,211, Cl. 191-25.000.

Bonder, Raymond: *See—*
Cholez, Roger; Bonder, Raymond; Menard, Jean-Paul; and Baudry, Etienne, 3,986,162.

Bonfield, Robert B., to Bardic Engineering Limited. Wheelchairs. 3,985,389, Cl. 297-347.000.

Bongaerts, Stephan Jeanne: *See—*
De Haes, Louis Maria; Vermeulen, Leon Louis; Gevers, Hugo Karel; Bongaerts, Stephan Jeanne; Van Pee, Paul Desire; and Krafft, Werner, 3,985,561.

Bonsch, Francois Henry Rudolphe, to Roneo Vickers Limited. Offset printing machines. 3,985,074, Cl. 101-410.000.

Booland, Bernhard Tellekamp. Apparatus for showing materials and combinations of materials. 3,984,930, Cl. 40-65.000.

Boorujy, Edward J.; Boorujy, Thomas P.; and Higgins, Frank. Method of cleaning fabrics. 3,985,502, Cl. 8-137.000.

Boorujy, Thomas P.: *See—*
Boorujy, Edward J.; Boorujy, Thomas P.; and Higgins, Frank, 3,985,502.

Booth, Frederick C., to Allied Chemical Corporation. Multiple locking retractor. 3,985,314, Cl. 242-107.40A.

Borchard, Heinz; Kasch, Robert; Rybka, Bruno; and Knothe, Herbert, to TED Bildplatten Aktiengesellschaft; and AEG-Telefunken-Teldec. Method for producing a grinding foil. 3,985,521, Cl. 51-295.000.

Borg-Warner Corporation: *See—*
Boyer, Nicodemus E., 3,985,831.
Falk, John C., 3,985,829.
Lemon, Robert W., 3,985,063.

Bornmann, Paul: *See—*
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Borsatti, Mario: *See—*
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Bossert, Freidrich: *See—*
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Bossler, Thomas H.: *See—*
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Bouldin, Kent W.: *See—*
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Bourke, Robert E.: *See—*
Summers, James B.; and Bourke, Robert E., 3,985,171.

Boutmy, Patrick Emile; and Walraet, Jean Gaston, to Societe Anonyme de Telecommunications. Device for ensuring in an intermediate station the transfer and the branch connection of at least one multiplexed numerical data channel. 3,985,963, Cl. 179-15.0BD.

Bovitz, Thomas Frank, to Sperry Rand Corporation. Toggle switch/indicator circuit. 3,986,039, Cl. 307-137.000.

Bowers, Kenneth E., to Ethyl Development Corporation. Apparatus for removing a hollow article from mandrel. 3,985,239, Cl. 214-1.0BD.

Boyce, Elvin L.; and Robinson, William Keith, to Tape-Licator, Inc., a part interest. Filter mask. 3,985,132, Cl. 128-146.200.

Boyer, Nicodemus E., to Borg-Warner Corporation. Flame retardant graft polymer compositions prepared from phosphinyl-substituted acrylonitriles. 3,985,831, Cl. 260-880.00R.

Brackmann, Warren A.; and Dilanni, Daniel, to Rothmans of Pall Mall Canada Limited. Extrusion head for producing polymeric material fibres. 3,985,481, Cl. 425-72.00S.

Bradford, Christopher William; and Baldwin, Stephen George, to Johnson Matthey & Co., Limited. Recovery of PT/RH from car exhaust catalysts. 3,985,854, Cl. 423-22.000.

Bradley, Frank R. Triggered display for telephone line characteristic measuring instrument. 3,985,980, Cl. 179-175.30R.

Brady, de Cordova Maxwell. Platform stabilizing systems. 3,985,320, Cl. 244-93.000.

Brady, Joseph P. Golf training device. 3,985,364, Cl. 273-183.00B.

Bragdon, Robert Wright: *See—*
Thunberg, Jon Carl; Bragdon, Robert Wright; and Moore, William Philip, 3,985,801.

Braggins, George Roderick, to Wellman Bibby Company Limited, The. Load release devices. 3,985,213, Cl. 192-56.00R.

Brake Engineering, Inc.: *See—*
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Brandenstein, Manfred: *See—*
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 3,985,215.

Brandi, Hermann Th., deceased (by Brandi, Marianne, sole heiress); and Luckow, Herbert, to August Thyssen-Hutte Aktienges. Method of making large structural one-piece parts of metal, particularly one-piece shafts. 3,985,995, Cl. 219-76.000.

Brandi, Marianne, sole heiress: *See—*
Brandi, Hermann Th., deceased; and Luckow, Herbert, 3,985,995.

Brechbuehler, Hans Ulrich: *See—*
Herzog, Alexis; and Brechbuehler, Hans Ulrich, 3,985,877.

Bredero Price, B.V.: *See—*
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Bredeweg, Roger L., to Leco Corporation. Combustion system. 3,985,505, Cl. 23-230.0PC.
Brenez, Jean, to Societe des Plastiques BRENEZ. Spray head. 3,985,299, Cl. 239-119.0PC.
Brenner, L. Martin; and Brush, Charles K., to SmithKline Corporation. Benzophenalenofurans. 3,985,896, Cl. 424-285.000.
Bress, Dellason F.: *See—*
Kaupas, Philip F.; and Bress, Dellason F., 3,985,523.
Bricker, Charles O. Pet door. 3,985,174, Cl. 160-180.000.
Bridwell, John W.: *See—*
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Bright, James A., to General Motors Corporation. Vertical tube ice maker. 3,984,996, Cl. 62-353.000.
Bristol-Myers Canada Limited: *See—*
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Bristol-Myers Company: *See—*
Crast, Leonard Bruce, Jr.; and Gottstein, William Joseph, 3,985,741.
Essery, John Michael; and Cheney, Lee Cannon, 3,985,740.
Kaplan, Murray Arthur; and Granatek, Alphonse Peter, 3,985,747.
Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, 3,985,738.
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British Steel Corporation: *See—*
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Smithson, Douglas James, 3,985,527.
Brock, Albert; Splisteser, Karl-Heinz; and Dobbrunz, Werner. Sweeping vehicles for sweeping roads and other surfaces. 3,984,894, Cl. 15-340.000.
Brodmann, Franz Josef, to General Refractories Company. Alkali resistant perlite - CaO vitreous fibers. 3,985,935, Cl. 428-401.000.
Brodsky, Larry: *See—*
Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, 3,985,278.
Brooks, John Langshaw; Budziarek, Richard; Crook, James William; and Vickers, Edward Jervis, to Imperial Chemical Industries Limited. Nitrogen-containing compounds. 3,985,793, Cl. 260-482.00B.
Broscheit, Wolfgang; Schwarz, Peter; and Wochnowski, Waldemar, to Hauni-Werke Korber & Co., KG. Method and apparatus for changing the moisture content of tobacco. 3,985,145, Cl. 131-135.000.
Brown, Charles Kepler, to Teledyne Mid-America Corporation. Apparatus for cutting and grooving a pipe. 3,985,051, Cl. 82-101.000.
Brown, Ethel A. Pickled seafood. 3,985,890, Cl. 426-324.000.
Brown, Robert A.: *See—*
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Brown, Terrance O.: *See—*
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Browning, Charles W.: *See—*
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Bruderlein, Francois T.; and Humber, Leslie G., to Ayerst McKenna and Harrison Ltd. Benzocycloheptaisoquinoline derivatives. 3,985,751, Cl. 260-283.00R.
Brunette, Norman R., to Automated Energy Systems, Inc. Method and apparatus for controlling yield of discrete pieces and characteristics thereof. 3,986,013, Cl. 235-151.330.
Brush, Charles K.: *See—*
Brenner, L. Martin; and Brush, Charles K., 3,985,896.
Bryan, Anthony G.: *See—*
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Bublitz, Donald E., to Dow Chemical Company, The. Method of controlling rice blast with N-(alkylthiophenyl)maleimides. 3,985,894, Cl. 424-274.000.
Buchel, Karl Heinz: *See—*
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Buck, Keith E.; Kitrilakis, Sotiris; and Robinson, Thomas C., to Searle Cardio-Pulmonary Systems Inc. Infant and pediatric ventilator. 3,985,131, Cl. 128-145.800.
Buckler, Robert Thomas; Hartzler, Harold Eugene; and Hayao, Shin, to Miles Laboratories, Inc. Phenyl- and (substituted)-phenyl-1,2,3-triazole-alkanoic and -alkenoic acids. 3,985,765, Cl. 260-308.00A.
Buckley, Frederick, III; Creamer, Malcom Kenneth, Jr.; and Miller, Gerald Aberdeen, to International Business Machines Corporation. CMOS digital circuits with resistive shunt feedback amplifier. 3,986,041, Cl. 307-205.000.
Buckley, Frederick, III; Miller, Gerald Aberdeen; and Scotto, Vincent Anthony, to International Business Machines Corporation. CMOS digital circuits with active shunt feedback amplifier. 3,986,043, Cl. 307-205.000.
Bucyrus-Erie Company: *See—*
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Budziarek, Richard: *See—*
Brooks, John Langshaw; Budziarek, Richard; Crook, James William; and Vickers, Edward Jervis, 3,985,793.
Budzich, Tadeusz. Load responsive fluid control valves. 3,984,979, Cl. 60-445.000.
Buehler, William J. Method for continuously casting wire or the like. 3,985,177, Cl. 164-51.000.
Bugaut, Andree: *See—*
Lang, Gerard; and Bugaut, Andree, 3,985,499.
Buhr, Gerhard; and Steppan, Hartmut, to Hoechst Aktiengesellschaft. Photosensitive crosslinkable 1-carbonyloxy-1H-naphthalene-2-one polymers and process for their preparation. 3,985,566, Cl. 96-115.00R.
Building Components Research, Inc.: *See—*
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Bull, Hans, to Hermann Hemscheidt Maschinenfabrik. Prop-and-shoe assemblies of self-advancing mine roof-supports. 3,985,328, Cl. 248-354.00H.
Bulte, Jean-Claude: *See—*
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Bulthuis, Kornelis; Van der Wal, Johannes; and Derksema, Bram Johan, to U.S. Philips Corporation. Gas discharge laser. 3,986,141, Cl. 331-94.50C.
Bunker Ramo Corporation: *See—*
Masi, James Vincent, 3,985,427.
Burke, Donald J., to Continental Industries, Inc. Ball valve. 3,985,335, Cl. 251-176.000.
Burkett, Francis L., to Dow Chemical Company, The. Egg filler flat. 3,985,256, Cl. 217-26.500.
Burley, John Charles. Method and apparatus for cutting cloth. 3,985,997, Cl. 219-384.000.
Burlington Northern Inc.: *See—*
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Burniece, Thomas Francis, III: *See—*
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Burroughs Corporation: *See—*
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Quioque, Virgilio J.; Eldert, Cornelius; and Worst, John L., 3,986,094.
Burroughs Wellcome Co.: *See—*
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Hazlett, John R.; and Holstius, Elvin A., 3,985,876.
Busch, Jurgen P.: *See—*
Kortenhaus, Dieter; and Busch, Jurgen P., 3,985,217.
Bussard, Willis A., to Altair Industries, Inc. Collapsible building structure. 3,984,948, Cl. 52-69.000.
Butti, Adriano; Prino, Giuseppe; and Mantovani, Marisa, to Crinos Industria Farmacobiologica S.p.A. Pharmaceutical heparinoidic factor-containing composition and therapeutic use thereof. 3,985,871, Cl. 424-104.000.
Buzza, Richard S., to Pittsburgh Forgings Company. Center filler, center plate construction for railway vehicles. 3,985,235, Cl. 213-57.000.
Bylander, Ernest G., to Texas Instruments. Gas discharge display with control cells. 3,986,185, Cl. 340-324.00M.
Bylander, Magnus; and Ling, Bernt, to Allmanna Svenska Elektriska Aktiebolaget. Arrangement for determining visibility in the glide path of an aircraft. 3,985,452, Cl. 356-201.000.
Byrd, William J., to Salk Institute for Biological Studies, The. Automatic gamma radiation scanning device and feed mechanism for plural sample holders. 3,986,028, Cl. 250-328.000.
Cable, John A.; Cable, Stephen J.; and Falbo, Richard R., to United States Ceramic Tile Company. Method and apparatus for fast firing glazed ceramic tile trim pieces. 3,985,495, Cl. 432-2.000.
Cable, Stephen J.: *See—*
Cable, John A.; Cable, Stephen J.; and Falbo, Richard R., 3,985,495.
Cabut, Louis Antoine; and Huille, Michel Ernest Antoine, to Produits Chimiques Ugine Kuhlmann. Stable pigments. 3,985,569, Cl. 106-288.00Q.
Cabut, Louis Antoine; Hardouin, Jean-Claude Henri Raoul; Huille, Michel Ernest Antoine; and Pigasse, Daniel Francois Xavier, to Produits Chimiques Ugine Kuhlmann. Stable phthalocyanine pigments. 3,985,570, Cl. 106-288.00Q.
Cabut, Louis Antoine: *See—*
Nicaise, Jean-Claude Rene; and Cabut, Louis Antoine, 3,985,767.
Cade, Paul Edmand, to International Business Machines Corporation. Depletion mode field effect transistor memory system. 3,986,180, Cl. 340-173.0CA.
Cadman, Phillip B. Crutch carry-all attachment. 3,985,148, Cl. 135-66.000.
Caffo, John A.; Abela, Alexander A.; Ledbetter, Theodore N.; and Joubert, Darrell W., to United States of America, Air Force. Generation of submicrosecond pulses in a long laser. 3,986,129, Cl. 330-4.300.
Cafissi, Roberto: *See—*
Tirro, Sebastiano; Cafissi, Roberto; and Cavalieri d'Oro, Enzo, 3,986,123.
Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, to Societa' Italiana Resine S.I.R. S.p.A. Process for the production of vinyl acetate from ethylene. 3,985,794, Cl. 260-497.00A.
Calderon, Samuel. Heel cushion. 3,984,926, Cl. 36-37.000.
California Institute of Technology: *See—*
Rembaum, Alan; Yen, Shiao-Ping Siao; and Dreyer, William J., 3,985,632.
Callahan, Irvin J. Two-way plow with carrying bracket therefor. 3,985,187, Cl. 172-224.000.
Calvi, Salvatore J., to Pitney-Bowes, Inc. Control circuit for electrostatic copying machine. 3,985,433, Cl. 355-3.00R.
Cambridge Thermionic Corporation: *See—*
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Came, Donald M.: *See—*
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Camp, Russell John. Disposable animal trap. 3,984,936, Cl. 43-66.000.
Campbell, Clair E.: *See—*
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Campbell, Ian D.; Brown, Terrance O.; and Murray, Donald W., to Exxon Research and Engineering Company. High dropping point greases comprising a lithium soap of an epoxy-substituted and/or an ethylenically unsaturated fatty acid. 3,985,662, Cl. 252-41.000.
Campbell, Whitney Robertson; and Fardoux, Raymond Maurice, to Motorola, Inc. Audio compressor/limiter amplifier. 3,986,049, Cl. 307-237.000.
Canada Cycle and Motor Company Limited: *See—*
Farquharson, Charles R., 3,984,875.
Canadian Patents and Development Limited: *See—*
Chow, Suezone, 3,985,169.
Noblitt, Harvey Leander, 3,985,645.
Cannon, John G., to Westinghouse Air Brake Company. Wheel slip control of hydro-pneumatic brake apparatus. 3,985,397, Cl. 303-21.00F.
Canon Kabushiki Kaisha: *See—*
Matsumoto, Kazuya; and Yano, Akio, 3,985,419.
Takashima, Matsuo; Ohtsuka, Minoru; and Matsumoto, Kazuya, 3,985,444.
Cappa, Giulio, to Industrie Pirelli S.p.A. Rim for a pneumatic tire and a switch device for signaling a change in physical conditions in a pneumatic tire mounted on the rim. 3,985,984, Cl. 200-61.220.
Carino, John William, to General Electric Company. Capacitor case cover disc seal and venting means. 3,986,083, Cl. 317-230.000.
Carl Freudenberg, Firma: *See—*
Kurtze, Gunther; and Heckel, Klaus, 3,985,198.
Carlock, Charles R. Apparatus for locating and positioning a football on a football playing field. 3,985,356, Cl. 273-55.00R.
Carmet Company: *See—*
Martino, Eugene J.; and Walker, Irvin W., 3,985,367.
Carpenter, Walter L.; and Leonard, Ronald J., to Baxter Laboratories, Inc. Dual chamber reservoir. 3,985,135, Cl. 128-214.00D.
Carr, Albert A.; and Meyer, Donald R., to Richardson-Merrell Inc. Methods of inducing sedation using certain spiroalkanone-imides. 3,985,888, Cl. 424-267.000.
Carrier Corporation: *See—*
Herb, Carl C., 3,985,068.
Carsec AG: *See—*
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Carter, Donald J.; Hoffman, Garry S.; and Smith, Thomas M., to Little Manufacturing Company. Universal feed through capacitor. 3,986,084, Cl. 317-260.000.
Carter, John L.; and McGowan, Joseph, to United States of America, Army. Power divider and power combiner utilizing isolator-mismatch and isolator-reflector devices. 3,986,147, Cl. 333-1.100.
Casanova, Travis G.: *See—*
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Casey, William J.: *See—*
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Casolo, Angelo J., to Almag Pollution Control Corporation. Method and system for purifying liquid. 3,985,648, Cl. 210-27.000.
Castanino, Joseph J.; Lotus, John W.; and Meade, Alfred J., to False Alarm Deterrent Corporation. Method and apparatus for deterring false alarms. 3,986,184, Cl. 340-304.000.
Castillo, Adolfo: *See—*
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Catanzaro, Bartholomew Thomas. Remotely actuated emergency shaft seal. 3,985,365, Cl. 277-9.000.
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Gerlach, Richard K., 3,984,881.
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Kennicutt, Robert B.; and Mounts, William T., 3,985,385.
Meyer, David L.; and Stepe, Visvaldis A., 3,984,929.
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Cavalluzzi, Frank J. Coffee beverage drip brewer. 3,985,069, Cl. 99-295.000.
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Dougherty, Edward F., 3,985,814.
Taylor, Paul D.; Conciatori, Anthony B.; and Jones, Rufus S., Jr., 3,985,679.
Cengel, John A.; and Puskas, Imre, to Standard Oil Company (Indiana). Polybutene composition containing brominated dialkylhydantoin additive and use thereof. 3,985,672, Cl. 252-182.000.
Centaur Chemical Co.: *See—*
Avakian, Souren, 3,985,032.
Centro Sperimentale Metallurgico S.p.A.: *See—*
Iacotti, Italo; Malgarini, Giansilvio; and Pasero, Edoardo, 3,985,547.
Centronics Data Computer Corporation: *See—*
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McIntosh, Robert, 3,985,216.
Century International Corporation: *See—*
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Cepuritis, Talivaldis, to Johnson & Johnson. Tab fastener having fixed end anchored to diaper facing and backing. 3,985,136, Cl. 128-287.000.
Cerquone, Felice M.: *See—*
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Chabert, Henri; Chapurlat, Robert; Gigou, Claude; and Ruaud, Michel, to Rhone-Poulenc S.A. Polymerization of olefinic monomers using a four component initiator. 3,985,718, Cl. 526-113.000.
Challenge-Cook Bros., Incorporated: *See—*
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Chamberlin, James C.: *See—*
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Chamberlin, James W., to Eli Lilly and Company. Dihydro-A204. 3,985,872, Cl. 424-122.000.
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Chan, Francis Chee Keung; and Heinzelman, Edward, Jr., to Oakite Products, Inc. Metal protective coating compositions, their preparation and use. 3,985,584, Cl. 148-6.160.
Chaney, Preston E., to Sun Oil Company (Delaware). Inclinometer. 3,984,918, Cl. 33-366.000.
Chang, Eugene Yue Chieh; and Saxon, Robert, to American Cyanamid Company. Polymeric reaction products of thiodiethanol and diphenols. 3,985,708, Cl. 260-47.00R.
Chang, Yu-Wen: *See—*
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Charlton, Michael Roger, to William McGeoch & Company. Ultrasonic acoustic pulse echo ranging system. 3,985,030, Cl. 73-290.00V.
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Salzer, Erwin, 3,986,158.
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Chemtool, Inc.: *See—*
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Chenaux, Bernard: *See—*
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Chetta, Nicholas J., Jr. Table top waste receptacle. 3,984,941, Cl. 47-41.00R.
Chevrier, Francois X.; and Cogswell, Phillip L., to Chevrier, Francois X. Controlled actuator. 3,984,984, Cl. 60-632.000.
Chevron Research Company: *See—*
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Morgan, Barry S.; and Sandell, Richard P., 3,985,623.
Chieger, George; and Banerjea, Tara N., to Fruehauf Corporation. Composite extruded floor. 3,984,961, Cl. 52-593.000.
Childree, Herman Travis, to Howe-Baker Engineers, Inc. Waste gas burner assembly. 3,985,494, Cl. 431-175.000.
Chirash, William: *See—*
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Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, to Kumiai Chemical Industry Co., Ltd. Agricultural substituted 2-methylbenzanilide germicide. 3,985,804, Cl. 260-558.00P.
Choby, Edward G., Jr., to Allegheny Ludlum Industries, Inc. Phosphoric acid soldering flux. 3,985,586, Cl. 148-23.000.
Choby, Edward G., Jr., to Allegheny Ludlum Industries, Inc. Phosphoric acid soldering flux. 3,985,587, Cl. 148-23.000.
Cholez, Roger; Bonder, Raymond; Menard, Jean-Paul; and Baudry, Etienne, to Societe d'Etudes, Recherches et Constructions Electroniques - SERCEL. System for the multiplexed transmission of signals from seismic receivers. 3,986,162, Cl. 340-15.5TS.
Chow, Suezone, to Canadian Patents and Development Limited. Method of joining bodies of green lumber by finger joints. 3,985,169, Cl. 144-317.000.
Church, Peter K.; and Knutson, Oliver J., to Kaman Sciences Corporation. Sealing and densifying chrome plated metal parts. 3,985,916, Cl. 427-46.000.
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Ciccarelli, Roger N.; and Ims, Dale R., to Xerox Corporation. Plastic materials mixed with polar group containing materials. 3,985,666, Cl. 252-63.200.

Circle Seal Corporation: *See—*
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Cirelli, Frank, to Johnston, James R. Coupling device. 3,984,900, Cl. 24-238.000.

Ciro, Berneschi: *See—*
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Clapp, Roy A. Polarizing beam splitting unit. 3,985,425, Cl. 350-147.000.

Clark, Herbert D., to Universal Oil Products Company. Scale control agents. 3,985,671, Cl. 252-180.000.

Clark, John: *See—*
Mooney, Thomas; and Clark, John, 3,985,411.

Clark, William E., to Federal-Mogul Corporation. Apparatus for making polytetrafluoroethylene sealing elements with hydrodynamic action. 3,985,487, Cl. 425-304.000.

Clauss, Richard John; Tremmel, Robert Arnold; and Becking, Donald Harvey, to Oxy Metal Industries Corporation. Thioether sulfonates for use in electroplating baths. 3,985,784, Cl. 260-465.100.

Clay, Frank M.; Moran, Leland G.; and Lawyer, Russell R., to Owens-Corning Fiberglas Corporation. Apparatus for making foamed plastic pipe insulation. 3,985,483, Cl. 425-112.000.

Coalite and Chemical Products Limited: *See—*
Langsley, Gerald William, 3,985,710.

Coca-Cola Co., The: *See—*
Rodth, Joseph John, 3,985,272.

Cochran, David S., to Hewlett-Packard Company. Automatic display segment intensity control. 3,986,186, Cl. 340-335.000.

Codding, Harold E.: *See—*
Pyzel, Ewald D.; and Codding, Harold E., 3,985,371.

Cogliano, Joseph, to W. R. Grace & Co. Wettable polyolefin battery separator. 3,985,580, Cl. 264-121.000.

Cogswell, Phillip L.: *See—*
Chevrier, Francois X.; and Cogswell, Phillip L., 3,984,984.

Cohen, Choua; Durif-Varambon, Bruno; Salle, Robert; and Sillion, Bernard, to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf. Dicarboxylic compounds having 2,4-quinazolinedione rings and polyester resins derived therefrom. 3,985,711, Cl. 260-75.00N.

Cole, Edward L.: *See—*
Estes, John H.; and Cole, Edward L., 3,985,678.

Coleman, Steven J., to Thermo Electron Corporation. Spirometer. 3,985,124, Cl. 128-2.080.

Colgate-Palmolive Company: *See—*
Inamorato, Jack T.; and Chirash, William, 3,985,687.

Collectramatic, Inc.: *See—*
Pottinger, Eugene A.; and Shelton, Winston L., 3,985,071.

Collin, Per Harald; and Johansson, Folke Karl Evald, to Stora Kopparbergs Bergslags Aktiebolag. Method for simultaneous combined production of electrical energy and crude iron. 3,985,544, Cl. 75-11.000.

Collis, George C. Electric tooth brush. 3,984,890, Cl. 15-22.00R.

Collman, James P.; and Komoto, Robert G., to Leland Stanford Junior University, The Board of Trustees of. Method of producing alkali metal tetracarbonylferrates and solvates thereof. 3,985,770, Cl. 260-340.600.

Colortronic Reinhard & Co., KG: *See—*
Jakob, Peter Michael, 3,985,345.

Colourvision Associates: *See—*
Sword, Geoffrey; Lawrence, John Leslie; Raggett, Stephen Richard; and Blakemore, Bernard, 3,986,089.

Colpoys, John R. Telephony. 3,985,971, Cl. 179-18.0BG.

Colson Company, The: *See—*
Libhart, Anthony C., 3,985,208.

Colton, John Robert; Heick, Robert Bruce; and Mann, Henry, to Bell Telephone Laboratories, Incorporated. Common control constant shift reframe circuit. 3,985,967, Cl. 179-15.0BS.

Combustion Engineering, Inc.: *See—*
Torres, Jose Marcelo; and Musick, Charles Ronald, 3,985,613.

Comitate Nazionale per l'Energia Nucleare: *See—*
Alberti, Giulio; and Costantino, Umberto, 3,985,611.

Compagnie Generale de Radiologie: *See—*
Chekroun, Rene, 3,986,031.

Compagnie Generale d'Electricite: *See—*
Feuillade, Georges; Chenaux, Bernard; and Perche, Philippe, 3,985,574.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Durand, Jean-Michel; and Penicaud, Etienne, 3,985,979.

Conciatori, Anthony B.: *See—*
Taylor, Paul D.; Conciatori, Anthony B.; and Jones, Rufus S., Jr., 3,985,679.

Conger, Robert L.; Menz, Frederic L.; and Roberts, Charles A., Jr., to United States of America, Navy. Ogival lens warhead. 3,985,077, Cl. 102-56.00R.

Conley, James F., to Maremont Corporation. Ammunition magazine for automatic firearms. 3,985,060, Cl. 89-34.000.

Connally, Carl A., to Ozark-Mahoning Company. Multiple effect processes of concentrating solution. 3,985,609, Cl. 159-48.00L.

Conrow, Ransom Brown; and Bernstein, Seymour, to American Cyanamid Company. Complement inhibitors. 3,985,884, Cl. 424-269.000.

Consolidated-Bathurst Limited: *See—*
Blais, Leo, 3,985,600.

Consupak, Inc.: *See—*
Farrell, John J., 3,985,485.

Container Corporation of America: *See—*
Bell, Richard L., 3,985,288.
Johnson, Fred J., 3,985,232.

Container Systems Corporation: *See—*
Farhat, David L.; and Reihm, Richard S., 3,985,231.

Continental Can Company, Inc.: *See—*
Hicks, Billy R., 3,985,286.
Kulesa, Edmund M., 3,985,261.
Smith, Milbourn L., 3,985,647.

Continental Industries, Inc.: *See—*
Burke, Donald J., 3,985,335.

Continental Oil Company: *See—*
Del Bel, Elsio; Jones, Donald C.; and Neuworth, Martin B., 3,985,812.
Johnson, Morris A.; and Yang, Kang, 3,985,856.

Control Data Corporation: *See—*
Beecroft, Harold James; Burniece, Thomas Francis, III; and Hennenfent, Douglas Joseph, 3,986,209.

Cooper, Abraham J. Precision investment casting apparatus with reservoir blocks. 3,985,178, Cl. 164-237.000.

Cooper, Duane H. Method and apparatus for control of FM beat distortion. 3,985,978, Cl. 179-100.4ST.

Cooper, Roydon B., to Pall Corporation. Dual coaxial bidirectional valves and filter assemblies and hydrostat systems containing the same. 3,985,652, Cl. 210-97.000.

Copeland Corporation: *See—*
King, Robert W.; and Anderson, Robert L., 3,985,473.

Cordis Corporation: *See—*
Harris, Donald L., 3,985,140.

Corey, Howard Seebree, Jr.; Barringer, William Charles; and Hansen, Lloyd Frank, to American Cyanamid Company. Asthma treatment by inhalation of micronized N,N-diethyl-4-methyl-1-piperazinecarboxamide pamoate. 3,985,868, Cl. 424-45.000.

Cornell, Cyrus J. Sawmill apparatus. 3,985,055, Cl. 83-367.000.

Corning Glass Works: *See—*
Flannery, James E.; and Wexell, Dale R., 3,985,534.
Grossman, David G., 3,985,531.
Grossman, David G., 3,985,532.
Grossman, David G., 3,985,533.

Cornu, Charly, to Etel S.A. Rotary mechanical amplifier or switching device. 3,985,042, Cl. 74-568.00R.

Corrado, Anthony P.; Timte, Frank; Rakowsky, Edward L.; Marchese, Vincent P.; and Bing, Charles W., to United States of America, Army. Self-sealing fluidic explosive initiator. 3,985,058, Cl. 89-1.00B.

Cosden Technology, Inc.: *See—*
Watson, James M., 3,985,822.

Cosgrove, John H., to FMC Corporation. Treatment of zinc hydroxide slurry and recovery of zinc-containing product therefrom. 3,985,858, Cl. 423-106.000.

Costantino, Umberto: *See—*
Alberti, Giulio; and Costantino, Umberto, 3,985,611.

Coste, Gilbert, to Fromageries Picon. Process for preparing a food product. 3,985,902, Cl. 426-582.000.

Coughlan, Standly T., to Ford Motor Company. Fluid filter cartridge. 3,985,657, Cl. 210-440.000.

Coulter Information Systems, Inc.: *See—*
Kuehnle, Manfred R., 3,985,437.
Weber, Harold J., 3,986,085.

Courdier, Jean-Francois: *See—*
Senes, Michel; Pottier, Michel; and Courdier, Jean-Francois, 3,985,681.

Cowdrick, Arthur, to Raymond Lee Organization, Inc., The, a part interest. Sky diver toy. 3,984,938, Cl. 46-86.00R.

Cowpland, Michael Christopher John; and Matthews, Terrance Headley. Audio frequency signalling systems for telephone systems. 3,985,976, Cl. 179-81.00B.

Crafton, Paul A., to Century International Corporation. Personal authority verification system. 3,985,998, Cl. 235-61.70B.

Crast, Leonard Bruce, Jr.; and Gottstein, William Joseph, to Bristol-Myers Company. Production of p-hydroxycephalexin. 3,985,741, Cl. 260-243.00C.

Creamer, Malcom Kenneth, Jr.: *See—*
Buckley, Frederick, III; Creamer, Malcom Kenneth, Jr.; and Miller, Gerald Aberdeen, 3,986,041.

Creusot-Loire: *See—*
Jouffray, Maurice, 3,985,234.
Leroy, Pierre; and Sprunck, Emile, 3,985,350.

Cricchio, Renato: *See—*
Johnson, Francis; and Cricchio, Renato, 3,985,783.

Crinos Industria Farmacobiologica S.p.A.: *See—*
Butti, Adriano; Prino, Giuseppe; and Mantovani, Marisa, 3,985,871.

Crisci, Harry: *See—*
Sonnenberg, Rudolph, 3,984,965.

Criswell, Robert Lenox: *See—*
Guido, Paul Vincent; and Criswell, Robert Lenox, 3,985,294.

Cronkright, Walter A.: *See—*
Mandelik, Bernard G.; and Cronkright, Walter A., 3,985,860.

Crook, James William: *See*—
Brooks, John Langshaw; Budziarek, Richard; Crook, James William; and Vickers, Edward Jervis, 3,985,793.
Crosfield Electronics Limited: *See*—
Dunkley, Rowland A. G., 3,985,953.
Cull, Neville L.; Pine, Lloyd A.; and Maness, Dale D., to Exxon Research and Engineering Company. Method of preparing solid contact materials. 3,985,682, Cl. 252-463.000.
Cusic, John W.; and Ellefson, Charles R., to G. D. Searle & Co. 5-Alkyl-10-(aminocarbonyl/aminomethyl/cyano)-10,11-dihydro-5H-dibenz[b,f]azepine-10-alkanamines. 3,985,730, Cl. 260-239.00D.
D & J Products: *See*—
DeLano, Arthur D., 3,984,888.
Daikin Kogyo Co., Ltd.: *See*—
Nakura, Kunihiro; and Yoshimura, Takayoshi, 3,985,238.
Dainippon Pharmaceutical Co., Ltd.: *See*—
Hayashi, Kouji; Hashimoto, Masahisa; Nakamura, Kiyoshi; Shimizu, Masanao; Hatano, Naonobu; and Takeyama, Kunihiko, 3,985,875.
Yoshimura, Yoshio; Yokogawa, Kanae; and Kawata, Shigeo, 3,985,869.
D'Alelio, Gaetano F. Halogenated esters of phosphorus-containing acids. 3,985,835, Cl. 260-956.000.
Dalton, Thomas B., to Westran Corporation. Dual pressure hydraulic pump. 3,985,470, Cl. 417-252.000.
Danfoss A/S: *See*—
Beierholm, Hans Mogens; and Henriksen, Niels Juul, 3,986,100.
Daniels, Peter J. L., to Schering Corporation. Aminoglycoside antibiotics. 3,985,727, Cl. 536-17.000.
Danielsson, Nils Allan; and Lindblom, Karl-Peter Christian. Method of obtaining stigmatic imaging in spectral analysis using a concave grating. 3,985,443, Cl. 356-99.000.
Darsie, Burns: *See*—
Kulczycki, Karol; and Darsie, Burns, 3,985,160.
Das, Manik L., to Sigma Chemical Company. Reagent and method for determination of globulin. 3,985,506, Cl. 23-230.00B.
Davidovits, Joseph: *See*—
Lefebvre, Michel S. M.; and Davidovits, Joseph, 3,985,925.
Davis, D. Carter; and Sawant, Ulhas S., to Rexnord Inc. Clearance system for crushers. 3,985,308, Cl. 241-290.000.
Davis, D. Carter; and Sawant, Ulhas S., to Rexnord Inc. Crusher clearing system. 3,985,309, Cl. 241-290.000.
Davis, George B., Jr. Caulking gun adapter for an electric hand drill. 3,985,273, Cl. 222-326.000.
Davis, John C. Method and apparatus for testing television receivers. 3,986,203, Cl. 358-10.000.
Davis, Leland E.: *See*—
Schneiter, Fred E.; Thompson, Arnold R.; Davis, Leland E.; and Kirchoff, George F., Jr., 3,985,076.
Dean, Peter Duncan Goodearl; and Lowe, Christopher Robin. Enzyme separation. 3,985,690, Cl. 260-6.000.
Dean, Roy Delmar; and Weiland, Richard Herschel, to Boeing Company, The. Variable pivot trailing edge flap. 3,985,319, Cl. 244-42.0DB.
Decker, David Richard; and Omori, Masahiro, to Varian Associates. Through-substrate source contact for microwave FET. 3,986,196, Cl. 357-22.000.
Decker, Raymond E.; and Prichard, Evan, to Challenge-Cook Bros., Incorporated. Outrigger and mounting means for truck with a conveyor boom. 3,985,036, Cl. 74-96.000.
Deepsea Ventures, Inc.: *See*—
Kuhlmann, Henry, 3,985,522.
Deere & Company: *See*—
Fowler, Gene Roger, 3,985,038.
Rolfes, Marlan John, 3,985,394.
Woods, Terrill Wayne, 3,985,386.
Deering Milliken Research Corporation: *See*—
Balla, Gyula, 3,985,604.
Eschenbach, Paul W., 3,985,001.
Klein, Norman E., 3,985,006.
De Fraeye, Dirk Jules Remi, to U.S. Philips Corporation. Electric incandescent lamp with support structure for a planar filament. 3,986,067, Cl. 313-273.000.
De Haes, Louis Maria; Vermeulen, Leon Louis; Gevers, Hugo Karel; Bongaerts, Stephan Jeanne; Van Pee, Paul Desire; and Krafft, Werner, to AGFA-GEVAERT N.V. Diffusion transfer process using silver halide emulsions with 90% chloride and high binder to silver halide ratios. 3,985,561, Cl. 96-29.00R.
De Kok, Hans: *See*—
Frische, Onno F.; and De Kok, Hans, 3,985,848.
DeLano, Arthur D., to D & J Products. Adjustable floating chair. 3,984,888, Cl. 9-347.000.
Delaplace, Lucien, to Stein Industrie. Grating with push bars for an incinerator. 3,985,084, Cl. 110-8.00R.
Del Bel, Elsio; Jones, Donald C.; and Neuworth, Martin B., to Continental Oil Company. Caustic refining of 2,3,6-trimethylphenol. 3,985,812, Cl. 260-621.00B.
DeLouise, Joseph: *See*—
Geraci, Alexander; and DeLouise, Joseph, 3,985,317.
Delzenne, Gerard Albert: *See*—
Mertens, Ludovicus Maria; and Delzenne, Gerard Albert, 3,985,562.
DeMaio, Dorian A. Hand-holdable laser system computer. 3,986,002, Cl. 235-78.00R.
de Mets, Albert, to Bison-werke Bahre & Greten GmbH & Co. KG. Continuously operating press for manufacture of panels, such as chipboards, fiberboards, or the like. 3,985,489, Cl. 425-371.000.
Denman, Stephen A. Portable hoist. 3,985,342, Cl. 254-164.000.
Dennhardt, Werner; and Schroter, Herbert, to Hoechst Aktiengesellschaft. Process and apparatus for automatic exposure time control in copying devices. 3,985,440, Cl. 355-68.000.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Pyrazolopyridine ketones. 3,985,757, Cl. 260-294.80C.
Deprez, Thomas A., to Gleason Works, The. Apparatus for finish rolling bevel pinions and gears. 3,985,012, Cl. 72-101.000.
Derksema, Bram Johan: *See*—
Bulthuis, Kornelis; Van der Wal, Johannes; and Derksema, Bram Johan, 3,986,141.
Desai, Dinesh Maganlal: *See*—
Somasekhara, Shankar; Desai, Dinesh Maganlal; and Upadhyaya, Navinchandra Vasantrai, 3,985,761.
Deschamps, Joseph P., to International Harvester Company. Single switch safety start system. 3,985,196, Cl. 180-103.00R.
De Taffin, Francois; and Plazanet, Jacques, to Societe Nationale des Poudres et Explosifs. Particulate nitrocellulose composition. 3,985,691, Cl. 260-13.000.
De Tola, Vincent D., to Raymond Lee Organization, Inc., The, a part interest. Freezer, vacuum, oven sewage treatment system. 3,985,086, Cl. 110-8.00P.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Knippschild, Gerd; and Schuster, Hubert, 3,985,862.
Reinhardt, Helmut; Trebinger, Karl; and Kallrath, Gottfried, 3,985,571.
deVos, Hendrik A. J.; and Labouliere, Elzear R., to GTE Sylvania Incorporated. Lighting fixture. 3,986,019, Cl. 240-147.000.
Deweyert, Harvey Rudolph: *See*—
Gray, Kenneth Russell; Van Blaricom, Lloyd Eugene; and Deweyert, Harvey Rudolph, 3,985,667.
Dhami, Kewal Singh, to International Telephone and Telegraph Corporation. Esters of sulfonyl dibenzoic acid. 3,985,716, Cl. 260-79.30R.
Diamond, Julius, to William H. Rorer, Inc. Phenyl propionic acids and derivatives thereof. 3,985,788, Cl. 260-469.000.
Diamond Shamrock Corporation: *See*—
Hora, Charles J.; and Babinsky, Andrew D., 3,985,631.
Dickey, Wayne: *See*—
Williamson, Gerald E.; Dickey, Wayne; and Koberlein, Ross D., 3,985,305.
Dickson, Alan Scott; and Leitch, James Rodger Campbell, to Edgcumbe Peebles Limited. Resistance indicating electrical testing equipment for testing insulation under high voltage conditions. 3,986,107, Cl. 324-54.000.
Dictaphone Corporation: *See*—
Whitney, James C., 3,986,004.
Didato, Thomas P. V-block center finder. 3,985,462, Cl. 408-72.00R.
Diederen, Willi: *See*—
Kutter, Eberhard; Austel, Volkhard; and Diederen, Willi, 3,985,891.
DIEHL: *See*—
Politzer, Anton; Sackenreuter, Hans; and Machmer, Wilhelm, 3,985,059.
Diehr, Hans-Joachim: *See*—
Hocker, Jurgen; Diehr, Hans-Joachim; and Merten, Rudolf, 3,985,789.
Diel, Peter J., to Ciba-Geigy Corporation. 3-Imino-1,2,4-benzotriazine-1-oxides. 3,985,745, Cl. 260-249.500.
Diepers, Heinrich; Pfister, Hans; and Jablonski, Karl-Heinz, to Siemens Aktiengesellschaft. Method of producing an electrical conductor. 3,985,281, Cl. 228-148.000.
Dieter, Karl Georg: *See*—
Voss, Hans Heinrich; Dieter, Karl Georg; and Reisinger, Konrad, 3,985,961.
Dilanni, Daniel: *See*—
Brackmann, Warren A.; and Dilanni, Daniel, 3,985,481.
Dileo, Christopher C.; and Pittaro, Richard J., to Krautkramer-Branson, Incorporated. Ultrasonic thickness measuring method and apparatus. 3,985,022, Cl. 73-67.80R.
DiLorenzo, James Vincent; Niehaus, William Charles; and Varnerin, Lawrence John, Jr., to Bell Telephone Laboratories, Incorporated. High efficiency gallium arsenide impatt diodes. 3,986,192, Cl. 357-13.000.
Dindorf, Wilhelm: *See*—
Kayser, Hans Dieter; and Dindorf, Wilhelm, 3,985,053.
Dineen, John J.: *See*—
Post, Lloyd D.; Holley, William J.; Kosonocky, Stephan; and Dineen, John J., 3,985,079.
Disl, Johann: *See*—
Blass, Gerhard; and Disl, Johann, 3,985,955.
Diversified Marketing Group, Inc.: *See*—
Ginsburg, Stanley D.; and Castoria, Nicholas J., 3,985,325.
Di Veto, Hilliard R., to Burroughs Corporation. Switch control apparatus for ribbon tensioning systems. 3,985,983, Cl. 200-61.180.
Divo, Claudio: *See*—
Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, 3,985,794.
Dixon, Babette, trustee: *See*—
Dixon, Paul H., 3,985,240.
Dixon, Paul H., to Dixon, Babette, trustee. Mechanism for transferring parts. 3,985,240, Cl. 214-1.0BB.

Doane, William M.: *See—*
Weaver, Mary Ollidene; Bagley, Edward B.; Fanta, George F.; and Doane, William M., 3,985,616.

Dobbrunz, Werner: *See—*
Brock, Albert; Splisteser, Karl-Heinz; and Dobbrunz, Werner, 3,984,894.

Dobson, Thomas A.: *See—*
Schilling, Guenther; and Dobson, Thomas A., 3,985,774.

Doemer, Josef, to Siemens Aktiengesellschaft. Regenerator for pulse code modulation systems. 3,986,053, Cl. 307-268.000.

Doerfler, Roger E., to Kelsey-Hayes Company. Differential pressure warning switch. 3,985,986, Cl. 200-82.00D.

Dohgane, Iwao: *See—*
Kobayashi, Katsumi; Dohgane, Iwao; Okabe, Hiromichi; and Tanimoto, Kenji, 3,985,819.

Dola, Frank Peter; and Rossler, Frederick William, Jr., to AMP Incorporated. Opposed edge slotted terminal electrical connector. 3,985,416, Cl. 339-98.000.

Dominey, Sam C.; and Mahoney, John J., to Tyco Laboratories, Inc. Helicopter blade crack indicator. 3,985,318, Cl. 244-17.110.

Domyan, Frank F., to International Telephone and Telegraph Corporation. Ball valve. 3,985,334, Cl. 251-159.000.

Donihue, Jerry L.: *See—*
Weirick, Richard A.; and Donihue, Jerry L., 3,985,981.

Donnelly Mirrors, Inc.: *See—*
Fleischer, Paul, 3,985,429.

Donohue, Brian T. Tip for veterinary surgical cauterization instrument. 3,985,137, Cl. 128-303.170.

Dorfman, Jan William. Disposable inner mould for boats. 3,985,330, Cl. 249-65.000.

Doss, Richard C., to Phillips Petroleum Company. Stabilization of mixtures of mercaptoalkylnitriles and thiodialkylnitriles. 3,985,673, Cl. 252-182.000.

Dossier, Michel, to Agence Nationale de Valorisation de la Recherche (ANVAR). Friction torque limiters. 3,984,997, Cl. 64-27.00R.

Dostert, Philippe, to Hoffmann-La Roche Inc. N,N-diethyl-N'-dibenzo[b,e]thiepin-11(6H)-ylidene -1,3-propanediamine and derivatives thereof. 3,985,895, Cl. 424-275.000.

Dotsch, Horst; Muller, Jurgen; and Schmitt, Hans-Jurgen, to U.S. Philips Corporation. Method of and device for detecting cylindrical magnetic domains by means of ferrimagnetic resonance. 3,986,181, Cl. 340-174.0TF.

Dougherty, Edward F., to Celanese Corporation. Production of alcohols from carboxylic acids. 3,985,814, Cl. 260-635.00D.

Doundoulakis, George J., to Casey, William J.; and Doundoulakis, Helias, part interest to each. Two-rotor engine. 3,985,110, Cl. 123-8.470.

Doundoulakis, Helias: *See—*
Doundoulakis, George J., 3,985,110.

Dow Chemical Company, The: *See—*
Bublitz, Donald E., 3,985,894.
Burkett, Francis L., 3,985,256.
Hyun, Kun Sup, 3,985,847.
Johnson, Francis; and Cricchio, Renato, 3,985,783.
Puki, Kenneth J., 3,985,175.
Ritzie, Robert H., 3,985,349.
Schlosser, James A.; and Trumbull, Walter A., 3,984,906.

Downs, Thomas C.: *See—*
Antrim, Warren W.; Baynes, Gene P.; Downs, Thomas C.; and Enghauser, James E., 3,985,477.

Doyel, John S. Ice cream machine. 3,985,347, Cl. 259-108.000.

Drake, Charles A., to Phillips Petroleum Company. Preparation of unsaturated nitriles. 3,985,786, Cl. 260-465.80R.

Dransch, Gunter Karl Wilhelm Otto, deceased; by Wiesenhutter, Annelise Klara Helene, heiress; and by Flersheim, Johanna Mathilde, heiress, to Hoechst Aktiengesellschaft. Process for the manufacture of 2-alkylsulfinyl-6-nitrobenz-thiazoles. 3,985,762, Cl. 260-306.000.

Dravo Corporation: *See—*
Vlnaty, Joseph; Snyder, George A.; and Anthes, John A., 3,985,543.

Dresser Industries, Inc.: *See—*
Martin, Albert Edward, 3,985,236.

Drew, John: *See—*
Larson, Kay R.; Drew, John; and Ott, Howard, 3,985,634.

Dreyer, William J.: *See—*
Rembaum, Alan; Yen, Shiao-Ping Siao; and Dreyer, William J., 3,985,632.

Drogi, Dieter: *See—*
Rix, Albert; and Drogi, Dieter, 3,985,220.

Du Pont of Canada Limited: *See—*
Pinney, Baden McDowall, 3,985,300.

Du Bois, Chester G.; and Pollari, Howard M., to Outboard Marine Corporation. Primer system for rotary combustion engine. 3,985,113, Cl. 123-187.50R.

Dudley, Homer W., to Bell Telephone Laboratories, Incorporated. Secret telephony. 3,985,958, Cl. 179-1.50R.

Duinker, Hans Dignus; and Vermeulen, Gerardus Antonius Wilhelmus, to U.S. Philips Corporation. Luminescent screen of a color television tube. 3,986,073, Cl. 313-477.00R.

DuKane Corporation: *See—*
Torn, William R., 3,985,957.

Dungan, Kendrick W.: *See—*
Seidehamel, Richard J.; and Dungan, Kendrick W., 3,985,897.

Dunkley, Rowland A. G., to Crosfield Electronics Limited. Gravure printing methods and apparatus with rotary shutter. 3,985,953, Cl. 178-6.60B.

Dunn, George L.; and Hoover, John R. E., to SmithKline Corporation. 3-Heterocyclic thiomethylcephalosporins. 3,985,739, Cl. 260-243.00C.

Du Pont de Nemours, E. I., and Company: *See—*
Faulhaber, Mark Edwin, 3,986,037.
Grot, Walther Gustav, 3,985,501.
Kidder, David Roy, 3,985,714.

Durand, Jean-Michel; and Penicaud, Etienne, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Half-echo suppressor for a terminal of a four-wire electric line. 3,985,979, Cl. 179-170.600.

Durif-Varambon, Bruno: *See—*
Cohen, Choua; Durif-Varambon, Bruno; Salle, Robert; and Sillion, Bernard, 3,985,711.

Durst AG Fabrik Fototechnischer Apparate: *See—*
Barbieri, Siegfried; and Obertegger, Franz, 3,985,450.

Dyckerhoff & Widmann AG: *See—*
Finsterwalder, Klemens, 3,985,480.

Dyer, Mahlon D.: *See—*
Smith, Charles W.; and Dyer, Mahlon D., 3,985,442.

Dymov, Gershon Davidovich: *See—*
Baum, Sergei Alexeevich; Meshkov, Nikolai Mikhailovich; Nikolaev, Mikhail Georgievich; Osipov, Evgeny Yakovlevich; Khaikin, Boris Alexandrovich; and Dymov, Gershon Davidovich, 3,985,225.

Dynamit Nobel Aktiengesellschaft: *See—*
Kotzsch, Hans Joachim; and Vahlensieck, Hans Joachim, 3,985,781.

Dzakowic, Thomas J.: *See—*
Fellnor, John R.; and Dzakowic, Thomas J., 3,985,497.

E. R. Squibb & Sons, Inc.: *See—*
Denzel, Theodor; and Hoehn, Hans, 3,985,757.
Hoehn, Hans, 3,985,760.
Koster, William Henry; Slusarchyk, William A.; and Bernstein, Jack, 3,985,746.
Narayanan, Venkatachala L.; and Haugwitz, Rudiger D., 3,985,755.
Narayanan, Venkatachala Lakshmi; and Angel, Richard G., 3,985,885.
Priestap, Horacio Alfredo; and Rappaport, Carlos, 3,985,768.
Vogt, Berthold Richard, 3,985,731.

Eagle-Picher Industries, Inc.: *See—*
Russell, Jerry L., 3,985,577.

Eastman Kodak Company: *See—*
Foster, Charles H., 3,985,749.
Gabrielsen, Rolf S.; and Cerquone, Felice M., 3,985,565.
Granger, Edward M., 3,986,202.
King, James R., 3,985,564.

Easy Riser, Inc.: *See—*
Gessler, Robert U., 3,985,323.

Eaton Corporation: *See—*
Sasena, John J., 3,985,343.
Shilling, John P.; and Sherrill, Derold L., 3,985,045.
Turkish, Michael C., 3,985,111.

Ebbert, Robert; and Simpson, Harold H., to Sybron Corporation. Mechanical device to mix amalgam. 3,985,307, Cl. 241-284.000.

Eberly, Paul Earl, Jr., to Exxon Research and Engineering Company. Use of water/methanol mixtures as solvents for aromatics extraction. 3,985,644, Cl. 208-321.000.

Ecodyne Corporation: *See—*
Blaine, Louis I., 3,985,859.

Eddelman, Roy T. Ferromagnetic separation process and material. 3,985,649, Cl. 210-42.00S.

Edenhofer, Albrecht; Spiegelberg-Schoop, Hans, deceased; by Spiegelberg, Annemarie, heiress; by Spiegelberg-Schoop, Anna, heiress; and Spiegelberg-Von der Crone, Hans, heir, to Hoffmann-La Roche Inc. Cyanoethyl acetamidine compounds. 3,985,785, Cl. 260-465.50R.

Edgcumbe Peebles Limited: *See—*
Dickson, Alan Scott; and Leitch, James Rodger Campbell, 3,986,107.

Edmonston, William H., to Lectron Products, Inc. Carburetor. 3,985,839, Cl. 261-44.00R.

Edstrom, Nils Herbert; and Haglund, Bo Gustav, to Telefonaktiebolaget L M Ericsson. Telephone system comprising a satellite. 3,986,120, Cl. 325-4.000.

Edwards, John D., to Rolm Corporation. Method and apparatus for generating digital dual frequency signals. 3,985,966, Cl. 179-15.0BY.

Edwards, Roderick Ivan, to National Institute for Metallurgy. Separation of platinum group metals and gold. 3,985,552, Cl. 75-101.0BE.

Egnaczak, Raymond K.: *See—*
Urbanek, Edwin A.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vsevolod; Teumer, Roger G.; and Egnaczak, Raymond K., 3,985,434.

Eguchi, Osamaru: *See—*
Fukai, Masakazu; Fujiwara, Shinji; Serizawa, Hiroyuki; Eguchi, Osamaru; and Kuramoto, Yukimasa, 3,985,918.

Ehle, Joachim; and Windgassen, Karl-Friedrich, to Messer Griesheim GmbH. Process and device for filling multilayer pressure containers. 3,984,994, Cl. 62-45.000.

Ehrlich, John J.; and Barr, Thomas A., Jr., to United States of America, Army. Method for producing chemical laser output from radiative decomposition of chemicals. 3,986,137, Cl. 331-94.50P.

Eibner, Jules A., to Sperry Univac Corporation. Phase detector having a 360 linear range for periodic and aperiodic input pulse streams. 3,986,125, Cl. 328-62.000.

Eichelberger, Edward Baxter; and Robbins, Gordon Jay, to International Business Machines Corporation. High performance latch circuit. 3,986,057, Cl. 307-289.000.

Eickelberg, Henry L. Walking beam device for conveying materials at high temperature. 3,985,496, Cl. 432-122.000.

Eidem, Brian L., to Armco Steel Corporation. Chain-wire rope anchoring systems and anchoring systems and connectors therefor. 3,985,093, Cl. 114-206.00R.

Eisai Co., Ltd.: *See—*
Tanaka, Satoru; Hashimoto, Kazunori; Watanabe, Hideaki; and Munakata, Keiichi, 3,985,779.

Eisenberg, Robert M., to Singer Company, The. Simulated communications system. 3,985,969, Cl. 179-15.00A.

Ejchorszt, Olgierd Z. Body stall shower structure. 3,984,879, Cl. 4-145.000.

Eldert, Cornelius: *See—*
Quiogue, Virgilio J.; Eldert, Cornelius; and Worst, John L., 3,986,091.
Quioque, Virgilio J.; Eldert, Cornelius; and Worst, John L., 3,986,094.

Electronic Chassis Corporation: *See—*
Allen, Richard Michael, 3,985,275.

Electronics Stamping Corporation: *See—*
Walter, Leo; and Greul, Helmut W., 3,985,414.

Elektro-Physik, Hans Nix & Dr. -Ing. E. Steingroever KG: *See—*
Nix, Hans F.; and Steingroever, Erich, 3,986,105.

Elges, Carl H., III: *See—*
Haskett, Philip R.; Bauer, Donald J.; Elges, Carl H., III; and Lindstrom, Roald E., 3,985,855.

Eli Lilly and Company: *See—*
Chamberlin, James W., 3,985,872.
Holland, Donald R.; and Steinberg, Mitchell I., 3,985,893.
Kornfeld, Edmund C.; and Bach, Nicholas J., 3,985,752.
Kress, Thomas J.; and Moore, Larry L., 3,985,759.
Prince, Kenneth E., 3,985,289.
Spitzer, Wayne A., 3,985,737.
Svoboda, Gordon H., 3,985,899.

Elitex, Zavody textilniho strojirenstvi generalni reditelstvi: *See—*
Kouklik, Ivo; and Navratil, Josef, 3,985,002.

Ellefson, Charles R.: *See—*
Cusic, John W.; and Ellefson, Charles R., 3,985,730.

Elliott, Jennings W., to Schlumberger Technology Corporation. Methods and apparatus for recording well logging measurements. 3,986,163, Cl. 340-15.5DS.

Ellis, Leonard C.; and Kise, Mearl A., to Virginia Chemicals Inc. Stabilized sodium dithionite solutions. 3,985,674, Cl. 252-188.000.

Elmer, Ben R.; and Tchon, Wallace E., to Honeywell Information Systems, Inc. CCD register interface with partial-write mode. 3,986,172, Cl. 340-172.500.

Elmer, Ben R.; and Tchon, Wallace E., to Honeywell Information Systems, Inc. Fault-tolerant CCD memory chip. 3,986,179, Cl. 340-173.0BB.

Eloranta, Kalevi; Lindroos, Raimo; and Surakka, Jorma, to K. Oras Oy. Drain pipe sterilization. 3,985,994, Cl. 219-201.000.

Emerson Electric Co.: *See—*
Hargraves, David P., 3,985,154.

Emhart Industries, Inc.: *See—*
Hart, LeRoy, 3,985,008.

Ems, Herbert A.: *See—*
Vautrain, Lucien H.; and Ems, Herbert A., 3,985,864.

Enghauser, James E.: *See—*
Antrim, Warren W.; Baynes, Gene P.; Downs, Thomas C.; and Enghauser, James E., 3,985,477.

English Electric Valve Company Limited: *See—*
Pollard, John Francis, 3,986,148.
Scholz, Hans, 3,986,070.

Enoguchi, Yuji: *See—*
Tanaka, Susumu; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 3,985,436.

Eriksson, Leif; and Thornell, Lennart, to Allmanna Svenska Elektriska Aktiebolaget. Phase selective device. 3,986,128, Cl. 328-133.000.

Erlenbach, Walter. Ladder landing. 3,985,203, Cl. 182-120.000.

Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, to SKF Industrial Trading and Development Company, B.V. Clutch disengager device. 3,985,215, Cl. 192-98.000.

Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, to Hoechst Aktiengesellschaft. Process for the manufacture of acrylic acid. 3,985,800, Cl. 260-530.00N.

Erwin Sick Optik-Elektronik: *See—*
Plockl, Johann, 3,985,451.

Eschenbach, Paul W., to Deering Milliken Research Corporation. Take up and doffing apparatus for a circular knitting machine. 3,985,001, Cl. 66-149.00R.

Eschweiler & Co.: *See—*
Lubbers, Dietrich W.; and Huch, Albert, 3,985,633.

Esco Corporation: *See—*
Northe, Melvin M., 3,984,899.

Essery, John Michael; and Cheney, Lee Cannon, to Bristol-Myers Company. 7-[D-(α-amino-α-phenyl-, 2-thienyl- and 3-thienylacetamido)]-3-(5-methylthiazol-2-yl)carbonylthiomethyl-3-cephem-4-carboxylic acids. 3,985,740, Cl. 260-243.00C.

Essex International, Inc.: *See—*
Grawcock, Patrick L., 3,985,164.
Vogel, Ralph A.; and Grawcock, Patrick L., 3,985,163.

Essilor International (Compagnie Generale d'Optique): *See—*
Tagnon, Luc Andre, 3,985,445.

Estes, John H.; and Cole, Edward L., to Texaco Inc. Isoparaffin alkylation. 3,985,678, Cl. 252-429.00R.

Etel S.A.: *See—*
Cornu, Charly, 3,985,042.

Ethicon, Inc.: *See—*
Thyen, Eberhard; and Komarnycky, Peter, 3,985,227.

Ethyl Corporation: *See—*
Kao, James T. F., 3,985,834.
Marsee, Frederick J., 3,985,838.
Sanders, Robert N., 3,985,557.

Ethyl Development Corporation: *See—*
Bowers, Kenneth E., 3,985,239.
King, Harold W., 3,985,491.

Evans, John H., to Stant Manufacturing Company, Inc. Gas cap with clamp-in roll-over valve. 3,985,260, Cl. 220-203.000.

Evans, Joseph H., to Raychem Corporation. Method of making tubular plastic sleeves. 3,985,852, Cl. 264-132.000.

Evans, William Robert, to AMP Incorporated. Miniature electrical connector. 3,985,413, Cl. 339-17.0LM.

Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, to International Flavors & Fragrances Inc. Novel 3-furyl beta oxoalkyl sulfides, processes for producing same and methods for using same for altering the organoleptic properties of foodstuffs. 3,985,907, Cl. 426-535.000.

Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, to International Flavors & Fragrances Inc. 3-Furyl sulfides and foodstuff flavor compositions comprising same. 3,985,908, Cl. 426-535.000.

Ex-Cell-O Corporation: *See—*
Hendry, James W., 3,985,486.

Extracorporeal Medical Specialties Inc.: *See—*
Miller, Frederick W., III, 3,985,655.

Exxon Research and Engineering Company: *See—*
Arey, William F., Jr.; Hamner, Glen P.; and Sawyer, Willard H., 3,985,684.
Argurio, Federico; Borsatti, Mario; and Heindrijckx, Jan, 3,985,833.
Campbell, Ian D.; Brown, Terrance O.; and Murray, Donald W., 3,985,662.
Cull, Neville L.; Pine, Lloyd A.; and Maness, Dale D., 3,985,682.
Eberly, Paul Earl, Jr., 3,985,644.
Kalina, Theodore; and Marshall, Harry A., 3,985,519.
Moreau, James O., 3,985,020.
Newman, Neil F., 3,985,832.

Fagan, Kenneth W.: *See—*
Scelia, Richard P.; Fagan, Kenneth W.; and Protomastro, Michael G., 3,985,905.

Falbo, Richard R.: *See—*
Cable, John A.; Cable, Stephen J.; and Falbo, Richard R., 3,985,495.

Falk, John C., to Borg-Warner Corporation. High impact polyblends from hydrogenated butadiene polymers. 3,985,829, Cl. 260-879.000.

False Alarm Deterrent Corporation: *See—*
Castanino, Joseph J.; Lotus, John W.; and Meade, Alfred J., 3,986,184.

Famolare, Inc.: *See—*
Famolare, Joseph P., Jr., 3,984,925.

Famolare, Joseph P., Jr., to Famolare, Inc. Hybrid sole for shoes. 3,984,925, Cl. 36-31.000.

Fanta, George F.: *See—*
Weaver, Mary Ollidene; Bagley, Edward B.; Fanta, George F.; and Doane, William M., 3,985,616.

Fardoux, Raymond Maurice: *See—*
Campbell, Whitney Robertson; and Fardoux, Raymond Maurice, 3,986,049.

Farhat, David L.; and Reihm, Richard S., to Container Systems Corporation. Apparatus for transporting storing and dispensing frangible material. 3,985,231, Cl. 206-448.000.

Farinon Electric: *See—*
Parkhideh, Mehr Ali; and Mariotta, Claudio S., 3,986,146.

Farquharson, Charles R., to Canada Cycle and Motor Company Limited. Protective head gear. 3,984,875, Cl. 2-10.000.

Farrell, John J., to Consupak, Inc. Blow molding apparatus with multiple cycle core rods. 3,985,485, Cl. 425-242.00B.

Farrissey, William J., Jr.; and Onder, Besir K., to Upjohn Company, The. Polyimide fiber having a serrated surface and a process of producing same. 3,985,934, Cl. 428-397.000.

Fastaia, Anthony J., to United Technologies Corporation. Power contribution measurement system for internal combustion engines. 3,986,009, Cl. 235-151.300.

Fatjuk, Nina Maximovna: *See—*
Silaev, Alexandr Fedorovich; Matjushenko, Raisa Stepanovna; Popova, Larisa Nikolaevna; Kurganov, Vasily Alexandrovich; Markin, Mikhail Ivanovich; Kurakin, Viktor Ivanovich; Fatjuk, Nina Maximovna; and Nazarova, Anna Kapitonovna, 3,985,513.

Fatzer, Willy: *See—*
Schmid, Rolf; Lohse, Friedrich; Fatzer, Willy; and Batzer, Hans, 3,985,825.

Faul, Josef: *See—*
Gessler, Hans; and Faul, Josef, 3,985,244.

Faulhaber, Mark Edwin, to Du Pont de Nemours, E. I., and Company. Yarn detector with a self-calibrating circuit. 3,986,037, Cl. 250-562.000.

Fayling, Richard E., to Minnesota Mining and Manufacturing Company. Dual particle population magnetic recording medium. 3,986,205, Cl. 360-2.000.

Fayling, Richard E., to Minnesota Mining and Manufacturing Company. Magnetic recording medium with highly anisotropic particles. 3,986,206, Cl. 360-2.000.

Fedders Corporation: *See—*
Marino, Salvatore M., 3,985,054.

Federal-Mogul Corporation: *See—*
Clark, William E., 3,985,487.

Federico, Armando: *See—*
Herzlinger, George A.; Federico, Armando; and Kantrowitz, Arthur R., 3,985,123.

Federspiel, Joseph A., to FMC Corporation. Transmission control brake. 3,985,039, Cl. 74-481.000.

Fein, Marvin M.; Field, Nathan D.; and Williams, Earl P., to GAF Corporation. Metal complexes of hydroxyquinoline and polymeric porous granules. 3,985,540, Cl. 71-67.000.

Feit, Peter Werner, to Lovens Kemiske Fabrik Produktionsaktieselskab. Sulphamyl-benzoic acid derivatives. 3,985,777, Cl. 260-347.200.

Feldman, Sidney; and Barton, George G., to United States of America, Navy. Remote controlled, CRT digital display, LLLTV camera-sextant. 3,985,446, Cl. 356-144.000.

Felicetta, Vincent F.; and Wenzel, Donald E., to Georgia-Pacific Corporation. Drilling fluid composition. 3,985,659, Cl. 252-8.50A.

Fellnor, John R.; and Dzakowic, Thomas J., to Melting Systems, Inc. Scrap preheating system. 3,985,497, Cl. 432-72.000.

Felter, John V. Box for mounting diffusers. 3,985,158, Cl. 138-149.000.

Fenton, Hugh Miles Roxburgh, to Richardson, Russell William. Coupling device for electrical fixture. 3,985,417, Cl. 339-122.00F.

Ferguson, Alan N., to Minnesota Mining and Manufacturing Company. Sorbent foam material. 3,985,689, Cl. 260-2.50R.

Ferguson, Robert J., to Progressive Dynamics, Inc. Adjustable regulator vent cover. 3,985,157, Cl. 137-801.000.

Fernandez, Vicente Arregui: *See—*
Menendez, Francisco Javier Sitges; and Fernandez, Vicente Arregui, 3,985,857.

Fernbaugh, Francis W. Garment rack security device. 3,985,183, Cl. 211-7.000.

Ferry, William J.; Jones, Donald H.; and Graham, Roger K., to Rohm and Haas Company. Process for manufacture of acrylic core/shell polymers. 3,985,703, Cl. 260-42.290.

Ferry, William J.: *See—*
Jones, Donald H.; and Ferry, William J., 3,985,704.

Fetters, Lewis J.; and Bi, Le-Khac, to University of Akron, The. Star polymers and process for the preparation thereof. 3,985,830, Cl. 260-880.00B.

Feuillade, Georges; Chenaux, Bernard; and Perche, Philippe, to Compagnie Generale d'Electricite. Electrochemical elements in thin layers. 3,985,574, Cl. 429-162.000.

Fiber Controls Corporation: *See—*
Grice, Karl R., Jr., 3,984,895.

Field, Nathan D.: *See—*
Fein, Marvin M.; Field, Nathan D.; and Williams, Earl P., 3,985,540.

Field, Robert G.; and Mason, Marvin S., to GTE Sylvania Incorporated. Digital signal generator. 3,985,965, Cl. 179-15.0BY.

Fife, Rodger L., to Georgia-Pacific Corporation. Paperboard laminating adhesive containing polyvinyl acetate/styrenebutadine polymers; paraffin wax; clay; and polyalkyleneglycol. 3,985,937, Cl. 428-486.000.

Finch, Jack N.; and Ripley, Dennis L., to Phillips Petroleum Company. Catalytic cracking of alkanes. 3,985,641, Cl. 208-121.000.

Finsterwalder, Klemens, to Dyckerhoff & Widmann AG. Apparatus for the sectional cantilever construction of bridge girder systems. 3,985,480, Cl. 425-63.000.

Firestone Tire & Rubber Company, The: *See—*
Futamura, Shingo, 3,985,826.
Kay, Edward L., 3,985,706.

Firetrol, Inc.: *See—*
Hare, John E., 3,986,114.

Firmenich & Cie: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,985,906.

Fischer, Adolf, to BASF Aktiengesellschaft. Herbicide. 3,985,542, Cl. 71-88.000.

Fischer, Artur. Thermal cutting apparatus. 3,985,996, Cl. 219-221.000.

Fischer, Earl R., to General Motors Corporation. Altitude compensated carburetor float valve. 3,985,836, Cl. 261-39.00A.

Fischer, Hans Peter: *See—*
Foery, Werner; and Fischer, Hans Peter, 3,985,780.

Flament, Ivon: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,985,906.

Flannery, James E.; and Wexell, Dale R., to Corning Glass Works. Spontaneously-formed fluormica glass-ceramics. 3,985,534, Cl. 65-33.000.

Flash Technology Corporation of America: *See—*
Kearsley, Wayne A., 3,986,096.

Flatten, Orris H.: *See—*
Jenkins, Jon Arthur; Flatten, Orris H.; and Hyman, Oscar E., 3,985,133.

Fleischer, Paul, to Donnelly Mirrors, Inc. Strengthened, shatter-resistant vehicular mirror. 3,985,429, Cl. 350-288.000.

Flersheim, Johanna Mathilde, heiress: *See—*
Dransch, Gunter Karl Wilhelm Otto, deceased; Wiesenhutter, Annelise Klara Helene, heiress; and Flersheim, Johanna Mathilde, heiress, 3,985,762.

Floris, Telemaco: *See—*
Girotti, Pier Leone; Tesei, Renato; and Floris, Telemaco, 3,985,821.

Floyd, Middleton Brawner, Jr.; and Weiss, Martin Joseph, to American Cyanamid Company. 11α-homo-prostanoic acids and esters. 3,985,798, Cl. 260-514.00D.

FMC Corporation: *See—*
Cosgrove, John H., 3,985,858.
Federspiel, Joseph A., 3,985,039.
Forcella, Peter W.; Meek, Donald S.; and French, Gary D., 3,985,223.
Kressly, Richard H., 3,985,222.
Manganaro, James L., 3,985,744.

Foery, Werner; and Fischer, Hans Peter, to Ciba-Geigy Corporation. β-Halogenoethyl-silanes as plant growth regulators. 3,985,780, Cl. 260-448.80R.

Fontanella, Luigi; and Mariani, Luigi, to Gruppo Lepetit S.p.A. 5-Chloro-2-hydroxymethyl benzhydrol. 3,985,811, Cl. 260-618.00B.

Food Technology, Inc.: *See—*
Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, 3,985,912.

Foote, Jerrold L.: *See—*
Stanley, Theodore H.; and Foote, Jerrold L., 3,985,141.

Forcella, Peter W.; Meek, Donald S.; and French, Gary D., to FMC Corporation. Universal gripper assembly for frozen confections. 3,985,223, Cl. 198-479.000.

Ford, John Randolph, to RCA Corporation. Apparatus for erecting a true vertical axis. 3,985,033, Cl. 73-505.000.

Ford Motor Company: *See—*
Coughlan, Standly T., 3,985,657.
Lingscheit, James N.; and Whalen, Thomas J., 3,985,576.
Ludwig, Frank A., 3,985,575.
Mrdjenovich, Robert, 3,985,546.
Stockton, Thomas R., 3,985,044.

Forenade Fabriksverken: *See—*
Gronvall, Karl Olof Ragnar, 3,984,983.

Forman, Christopher S.; and Gerlach, Richard K., to CaTel Manufacturing Inc. Panel structure for use on water bodies. 3,984,882, Cl. 4-172.000.

Fort, J. Robert; Westphal, James A.; and Juilfs, Donald R., to Geophysical Systems Corporation. Data compositing and array control system. 3,986,008, Cl. 235-151.300.

Fortenbery, Justice A. Web folding apparatus. 3,985,351, Cl. 270-62.000.

Foster, Charles H., to Eastman Kodak Company. Process for preparation of 4-aminoquinazoline. 3,985,749, Cl. 260-256.40Q.

Foster, Christopher A.: *See—*
Turnbull, Robert J.; Foster, Christopher A.; and Hendricks, Charles D., 3,985,841.

Foster Wheeler Energy Corporation: *See—*
Guido, Paul Vincent; and Criswell, Robert Lenox, 3,985,294.
Kaupas, Philip F.; and Bress, Dellason F., 3,985,523.

Fowler, Gene Roger, to Deere & Company. Self-aligning idler. 3,985,038, Cl. 74-242.10A.

Fowler, Lambuth G. Cotton stripping apparatus. 3,984,968, Cl. 56-33.000.

Fox, Kenneth W., to Lawrence Peska Associates, Inc., a part interest. Container seal prover. 3,985,018, Cl. 73-52.000.

Franco, Armando: *See—*
Swenson, Carl Richard; Naughton, Frank C.; and Franco, Armando, 3,985,568.

Frankenberg, Wolfgang; and Lentz, Claus, to Siemens Aktiengesellschaft. Monitoring circuit for a plurality of valves. 3,986,103, Cl. 323-24.000.

Franz, Henry W., to Kennecott Copper Corporation. Method of and apparatus for sampling molten slag. 3,985,031, Cl. 73-423.00R.

Franz, John E.: *See—*
Alt, Gerhard H.; and Franz, John E., 3,985,773.

French, Gary D.: *See—*
Forcella, Peter W.; Meek, Donald S.; and French, Gary D., 3,985,223.

Freudlsperger, Fritz. Device to raise and lower box-shaped construction elements, in particular prefabricated garages. 3,985,237, Cl. 214-1.00H.

Fried, John H.: *See—*
Muchowski, Joseph M.; and Fried, John H., 3,985,791.

Friel, John P.; and Hammond, Paul L., to Petrolite Corporation. Process of reclaiming lube oils. 3,985,642, Cl. 208-180.000.

Frisch, Kurt C.; Reegen, Sidney L.; and Bauer, Harry L., to Atlantic Richfield Company. Cyclic nitriles as crosslinking agents and compositions therefrom. 3,985,713, Cl. 260-77.5CR.

Frische, Onno F.; and De Kok, Hans, to Bredero Price, B.V. Method for cutting concrete coated pipe. 3,985,848, Cl. 264-88.000.

Frochaux, Alain, to Barry Wright Corporation. Variable two stage air nozzle. 3,985,302, Cl. 239-424.000.

Fromageries Picon: *See—*
Coste, Gilbert, 3,985,902.

Fruehauf Corporation: *See—*
Chieger, George; and Banerjea, Tara N., 3,984,961.

Frungel, Frank. Device for measuring optical characteristics of the atmosphere of an airfield. 3,986,023, Cl. 250-239.000.

Fry, Stephen M.; and Masuda, Himeo B., to United States of America, Army. Device for adjusting laser system pulse forming network voltage on replacement of power supply or receiver transmitter unit. 3,986,117, Cl. 324-133.000.

Fuchs, Francis Joseph, Jr., to Western Electric Company, Inc. Continuous extrusion. 3,985,011, Cl. 72-60.000.

Fuji Photo Film Co., Ltd.: *See—*
Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,985,563.

Fuji Xerox Co., Ltd.: *See—*
Nagashima, Toshio; Nakaguchi, Mitsuharu; Tsukamoto, Takuzo; Okada, Ryuzo; Kito, Hidetoshi; and Handa, Kenichi, 3,985,099.

Fujimori, Yoshio: *See—*
Kono, Yasumasa; Miyahara, Shuji; Nomura, Susumu; Ohkubo, Hiroyuki; Fujimori, Yoshio; Iwawaki, Akira; and Hirata, Hiromasa, 3,984,943.

Fujimoto, Masaharu: *See—*
Murakami, Masuo; Takahashi, Kozo; Iwanami, Masaru; Fujimoto, Masaharu; Shibanuma, Tadao; Kawai, Ryutaro; and Takenaka, Toichi, 3,985,758.

Fujiwara, Akinobu. Burglar alarm. 3,986,183, Cl. 340-276.000.

Fujiwara, Katsuji. Steam trap with bimetal valve control. 3,985,296, Cl. 236-59.000.

Fujiwara, Mitsuo; Tamura, Hifumi; and Kondo, Toshio, to Hitachi, Ltd. Ion microanalyzer. 3,986,025, Cl. 250-306.000.

Fujiwara, Shinji: *See—*
Fukai, Masakazu; Fujiwara, Shinji; Serizawa, Hiroyuki; Eguchi, Osamaru; and Kuramoto, Yukimasa, 3,985,918.

Fujiwara, Takao: *See—*
Tanaka, Susumu; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 3,985,436.

Fukai, Masakazu; Fujiwara, Shinji; Serizawa, Hiroyuki; Eguchi, Osamaru; and Kuramoto, Yukimasa, to Matsushita Electric Industrial Co., Ltd. Method for manufacturing a target for an image pickup tube. 3,985,918, Cl. 427-76.000.

Funahashi, Kohei, to Tokyo Shibaura Electric Co., Ltd. Color stripe filter with two protective layers. 3,986,069, Cl. 313-371.000.

Futamura, Shingo, to Firestone Tire & Rubber Company, The. Hydrogenated block copolymers of butadiene and isoprene. 3,985,826, Cl. 260-876.00B.

G. D. Searle & Co.: *See—*
Cusic, John W.; and Ellefson, Charles R., 3,985,730.
Tamir, Menachem; Martin, Manuel I.; and Magill, Robert J., 3,985,165.

G. D. Societa per Azioni: *See—*
Seragnoli, Enzo, 3,984,963.

Gabrielsen, Rolf S.; and Cerquone, Felice M., to Eastman Kodak Company. Photothermographic, composition using a phenolic leuco dye as a reducing agent. 3,985,565, Cl. 96-114.100.

GAF Corporation: *See—*
Fein, Marvin M.; Field, Nathan D.; and Williams, Earl P., 3,985,540.
Streck, Clemens, 3,985,500.

Galat, Alexander. Stable sodium acetylsalicylate and method for its manufacture. 3,985,792, Cl. 260-480.000.

Galinke, Joachim: *See—*
Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,985,943.

Gallei, Herbert, to Alfa-Laval AB. Manure remover. 3,985,103, Cl. 119-28.000.

Gallinato-Contino, Roland, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Guide devices. 3,985,403, Cl. 308-3.600.

Gardiner, Robert F.: *See—*
Randolph, Byron B., Jr., 3,986,104.

Gardner, Jack C., to Glasrock Products, Inc. Foam generating and dispensing device. 3,985,271, Cl. 222-190.000.

Gardner, John Nicholson, to Hoffmann-La Roche Inc. Preparation and use of magnesium acetylene complex. 3,985,817, Cl. 260-665.00R.

Garrett Corporation, The: *See—*
Beck, William H.; and Huggett, Colin E., 3,986,099.
Lewis, Leon David, 3,985,468.

Garst, John M., to Owens-Corning Fiberglas Corporation. Method and apparatus for preparing intermediate polyester resin. 3,985,712, Cl. 260-75.00M.

Garwood, Donald C.; and Taw, Harry, to Merck & Co., Inc. Photocurable contour conforming splint. 3,985,128, Cl. 128-90.000.

Gassman, Paul G.; and Gruetzmacher, Gordon D., to Ohio State University Research Foundation, The. Process for producing azasulfonium salts and rearrangement thereof to thio-ethers. 3,985,756, Cl. 260-294.80G.

Gatecliff, George W., to Tecumseh Products Company. Expansible chamber device. 3,985,475, Cl. 417-539.000.

Gault, Terrell W.: *See—*
Krummel, H. Karl; and Gault, Terrell W., 3,985,669.

Gautschi, Fritz: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,985,906.

Gebhard, Paul C., to Young Windows Inc. Butt joints. 3,985,461, Cl. 403-292.000.

Gebhardt, Gunter; and Peters, Josef, to Klockner-Humboldt-Deutz Aktiengesellschaft. Device for magnetic lifting and removal of the feed opening cover of a coking chamber oven. 3,985,627, Cl. 202-262.000.

Gehrmann, Klaus: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 3,985,800.

Gempler, Edward B., to United Aircraft Products, Inc. Method of joining braze alloy to a parent metal part. 3,985,283, Cl. 228-193.000.

General Cable Corporation: *See—*
Olszewski, Jerzy A.; and Jachimowicz, Ludwik, 3,985,948.

General Dynamics Corporation: *See—*
Krohn, Fritz F. W., 3,984,962.
MacTurk, William L., 3,985,851.

General Electric Company: *See—*
Carino, John William, 3,986,083.
Guth, Lauren W., deceased, 3,985,023.
Howell, Edward K., 3,986,152.

General Foods Corporation: *See—*
Kirkpatrick, Paul A., 3,985,909.
Kirkpatrick, Paul A., 3,985,910.
Scelia, Richard P.; Fagan, Kenneth W.; and Protomastro, Michael G., 3,985,905.

General Instrument Corporation: *See—*
Wunner, John J., 3,986,046.

General Mills Fun Group, Inc.: *See—*
Wolgamot, Chet; and Springer, Harvey G., 3,984,939.

General Motors Corporation: *See—*
Antrim, Warren W.; Baynes, Gene P.; Downs, Thomas C.; and Enghauser, James E., 3,985,477.
Ballantyne, David B., 3,985,172.
Bierlein, John C.; and Shipek, Edward J., 3,985,408.
Bright, James A., 3,984,996.
Fischer, Earl R., 3,985,836.
Harwick, Duane H.; and Schardt, Michael M., 3,985,985.
Lueders, Willi H., 3,985,221.
Manning, Donald L.; and Scheiter, Milton H., 3,985,035.
Nurse, Charles Alexander, 3,985,095.
Price, Robert T., 3,984,975.
Raivio, Roy K., 3,985,380.
Rogakos, Deno J.; and Johnston, Lynn M., 3,984,998.
Weinand, Louis H., 3,985,478.
Witherspoon, Romeo Richard; and Adams, Richard Leighton, 3,985,578.

General Refractories Company: *See—*
Brodmann, Franz Josef, 3,985,935.

General Switch Corporation: *See—*
Norden, Alexander R., 3,986,081.

Genthe, James E.: *See—*
Myers, Charles E.; and Genthe, James E., 3,985,098.

Geophysical Systems Corporation: *See—*
Fort, J. Robert; Westphal, James A.; and Juilfs, Donald R., 3,986,008.

George, Delbert L.: *See—*
Salzer, Erwin; and George, Delbert L., 3,986,157.

Georgia-Pacific Corporation: *See—*
Felicetta, Vincent F.; and Wenzel, Donald E., 3,985,659.
Fife, Rodger L., 3,985,937.
Petermann, James P.; Helversen, Frederick D.; and Thomas, Jack A., 3,985,572.

Georgoudis, Paul C., to National Starch and Chemical Corporation. Stabilized polyester compositions. 3,985,705, Cl. 260-45.80A.

Geraci, Alexander; and DeLouise, Joseph. Short coupled airplane with variable wing lift. 3,985,317, Cl. 244-13.000.

Gerbel, Lucien; and Waeselynck, Michel, to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine. Apparatus for recording in a digital form signals detected during magneto-telluric prospection. 3,986,207, Cl. 360-6.000.

Gerdes, Theo, to Blau KG Fabrik fur Kraftfahrzeugteile. Screw cap with lock cylinder. 3,985,007, Cl. 70-172.000.

Gerlach, Richard K., to CaTel Manufacturing Inc. Solar panel. 3,984,881, Cl. 4-172.000.

Gerlach, Richard K.: *See—*
Forman, Christopher S.; and Gerlach, Richard K., 3,984,882.

Gerry, Martin E. Low inertia impact printing means. 3,985,218, Cl. 197-54.000.

Gershnow, Abraham H.; and Vitale, Alexander F., to Centronics Data Computer Corporation. Spring wrap clutch with brake. 3,985,212, Cl. 192-12.0BA.

Gerster, John F., to Riker Laboratories, Inc. Substituted benzo[ij]quinolinzine-2-carboxylic acids and derivatives thereof as bactericidal agents. 3,985,882, Cl. 424-258.000.

Gerster, John F.: *See—*
Schuppan, Dietrich; Gerster, John F.; and Leir, Charles M., 3,985,753.

Gessler, Hans; and Faul, Josef, to Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung. Silo, or bin, for flowable solid material. 3,985,244, Cl. 214-17.00D.

Gessler, Robert U., to Easy Riser, Inc. Leg extender for chairs and other furniture. 3,985,323, Cl. 248-188.900.

Gevers, Hugo Karel: *See—*
De Haes, Louis Maria; Vermeulen, Leon Louis; Gevers, Hugo Karel; Bongaerts, Stephan Jeanne; Van Pee, Paul Desire; and Krafft, Werner, 3,985,561.

Ghirga, Marcello: *See—*
Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, 3,985,794.

Giacino, Christopher: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 3,985,907.

Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 3,985,908.

Gibson Battle & Co. Limited: *See—*
Short, David J., 3,986,038.

Gigou, Claude: *See—*
Chabert, Henri; Chapurlat, Robert; Gigou, Claude; and Ruaud, Michel, 3,985,718.

Gilb, Tyrell T., to Simpson Manufacturing Co., Inc. Truss ridge-joint connector assembly. 3,985,459, Cl. 403-217.000.

Gillemot, George W., to Thompson, John T., a part interest. Cable with turn back protector. 3,985,949, Cl. 174-70.00R.

Gilmore, William J., to American Chain & Cable Company, Inc. Non-conductive push-pull cable. 3,985,041, Cl. 74-501.00P.

Ginatta, Marco. Method of extracting metals from spent electric storage batteries. 3,985,630, Cl. 204-96.000.

Gindi, Abraham M.; Hong, Ju-Hi J.; and Stelzenmuller, William K., to International Business Machines Corporation. Serial pulse-code-modulated retiming system. 3,986,126, Cl. 328-63.000.

Ginsburg, Stanley D.; and Castoria, Nicholas J., to Diversified Marketing Group, Inc. Hook holder. 3,985,325, Cl. 248-223.000.

Giordano, Dominick J.: *See—*
Newcomb, Fred N.; and Giordano, Dominick J., 3,984,916.

Giorgetti, Giorgio; and Ciacci, Giancarlo. Combination ski boot, clamp and ski holder. 3,985,370, Cl. 280-605.000.

Gipstein, Edward; Moreau, Wayne M.; and Need, Omar U., III, to International Business Machines Corporation. Use of nitrocellulose containing 10.5 to 12% nitrogen as electron beam positive resists. 3,985,915, Cl. 427-43.000.

Giraudon, Raymond, to Rhone-Poulenc S.A. Phenylthiourea derivatives. 3,985,782, Cl. 260-455.00A.

Girotti, Pier Leone; Tesei, Renato; and Floris, Telemaco, to Snam Progetti S.p.A. Additive for improving the viscosity index of lubricating oils and lubricants so obtained. 3,985,821, Cl. 260-683.900.

Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, to Food Technology, Inc. Solidified product from molasses and wheat flour. 3,985,912, Cl. 426-622.000.

Glasl, Johann; Kreienfeld, Gunter; and Kroke, Hermann, to Henkel & Cie G.m.b.H. Plant growth regulators and process of regulating plant growth. 3,985,541, Cl. 71-78.000.

Glasrock Products, Inc.: *See—*
Gardner, Jack C., 3,985,271.

Glassow, Franklyn A., to Hughes Aircraft Company. Lock for despin bearing assembly. 3,985,209, Cl. 188-1.00R.

Gleason Works, The: *See—*
Deprez, Thomas A., 3,985,012.

Golan, Kenneth F.: *See—*
Morris, Hugh C.; Golan, Kenneth F.; and Schmitt, James L., 3,985,046.

Gold, Louis. Gasification process and apparatus. 3,985,520, Cl. 48-202.000.

Goldie, William Law, to British Steel Corporation; and Lamberton and Company Limited. Transfer and piling or stacking machine for lengths of ferromagnetic material. 3,985,241, Cl. 214-6.0FS.

Goldman, Irving M.: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,985,906.

Goldsmith, Robert L., to Abcor, Inc. Gaseous contaminate dosimeter and method. 3,985,017, Cl. 73-23.000.

Goll, Erwin, to Licentia Patent-Verwaltungs-G.m.b.H. Electron beam generating system with cathode. 3,986,066, Cl. 313-251.000.

Goltsos, Costas E., to Teckton, Inc. Microwave heating tray. 3,985,992, Cl. 219-10.55E.

Gonnam, Russell W.: *See—*
Hinman, Walter L., Jr.; and Gonnam, Russell W., 3,986,079.

Gonzalez Barberan, Carlos, to Instituto de Biologia Aplicada, S.A. Preparation of acidophil milk in powder form. 3,985,901, Cl. 426-43.000.

Good, Philip C.: *See—*
Siemens, Richard E.; and Good, Philip C., 3,985,556.

Gooding, David N.; and Shimp, Everett M., to International Business Machines Corporation. Arithmetic unit for use in a digital data processor and having an improved system for parity check bit generation and error detection. 3,986,015, Cl. 235-153.0BB.

Goodrich, David G.; and John, Ludwig, to Kaiser Aluminum & Chemical Corporation. Electromagnetic casting apparatus. 3,985,179, Cl. 164-250.000.

Goodyear Aerospace Corporation: *See—*
Madigan, Basil M., 3,986,118.

Goodyear Tire & Rubber Company, The: *See—*
Pierson, Robert M.; and Kuzma, Leonard J., 3,985,941.
Saltman, William M.; and Auerbach, Melvin, 3,985,709.
Shell, Robert L., 3,985,707.
Throckmorton, Morford C.; and Sandstrom, Paul H., 3,985,677.

Gottstein, William Joseph: *See—*
Crast, Leonard Bruce, Jr.; and Gottstein, William Joseph, 3,985,741.

Graham, Roger K.: *See—*
Ferry, William J.; Jones, Donald H.; and Graham, Roger K., 3,985,703.

Graham, Uel O.: *See—*
United States of America, National Aeronautics and Space Administration; Minton, Fred R.; and Graham, Uel O., 3,985,454.

Granatek, Alphonse Peter: *See—*
Kaplan, Murray Arthur; and Granatek, Alphonse Peter, 3,985,747.

Grandury, Yves, to Societe Mobiliere Industrielle. System and method for loading and unloading a storage apparatus from a vehicle. 3,985,254, Cl. 214-515.000.

Granger, Edward M., to Eastman Kodak Company. Processing apparatus and method for color video signals. 3,986,202, Cl. 358-4.000.

Grasseschi, John J. Water closet. 3,984,878, Cl. 4-34.000.

Grawcock, Patrick L., to Essex International, Inc. Apparatus and method for forming circular dynamoelectric machine field windings by pushing. 3,985,164, Cl. 140-92.100.

Grawcock, Patrick L.: *See—*
Vogel, Ralph A.; and Grawcock, Patrick L., 3,985,163.

Gray, Don N., to Owens-Illinois, Inc. Oxazolidone derivatives of chloromethylated polymers and methods of making the same. 3,985,715, Cl. 526-15.000.

Gray, Kenneth Russell; Van Blaricom, Lloyd Eugene; and Deweyert, Harvey Rudolph, to International Telephone and Telegraph Corporation. Process and composition for drilling shale formation in sea water. 3,985,667, Cl. 252-8.50A.

Green, Harry E.: *See—*
Hoffmann, Hermann; Held, Byron G.; Green, Harry E.; and Van Essen, Harold E., 3,985,724.

Green, Walter F. Variable restriction fuel flow meter. 3,985,029, Cl. 73-210.000.

Greeson, Richard L.; and Philofsky, Elliott M., to Motorola, Inc. Metallization system for semiconductor devices, devices utilizing such metallization system and method for making devices and metallization system. 3,985,515, Cl. 29-195.000.

Greul, Helmut W.: *See—*
Walter, Leo; and Greul, Helmut W., 3,985,414.

Grice, Karl R., Jr., to Fiber Controls Corporation. Density sensing and controlling equipment. 3,984,895, Cl. 19-240.000.

Griess, Roy K., to International Business Machines Corporation. Ramp release and reset circuit for a three phase voltage regulator. 3,986,047, Cl. 307-228.000.

Griffin, Lawrence C.; Peters, Homer D. F.; and Smith, Douglas E., to Owens-Illinois, Inc. Surface coating test apparatus. 3,985,026, Cl. 73-150.00R.

Grimm, Robert A.; Portwood, Owen; Sedor, Edward A.; and Williams, Jeannene A., to Ashland Oil, Inc. Alkoxy derivatives of hydroxy aminimides. 3,985,807, Cl. 260-561.00B.

Gripe, William B.; and Norman, Melvin H., to Amot Controls Corporation. Spool valve. 3,985,337, Cl. 251-324.000.

Gronvall, Karl Olof Ragnar, to Forenade Fabriksverken. Power control compressor arrangement in hot gas engine. 3,984,983, Cl. 60-521.000.

Groot, Theodorus Cornelis, to U.S. Philips Corporation. Resilient clamping members for color selection electrode. 3,986,071, Cl. 313-404.000.

Grose, Ronald M., to United States of America, Air Force. Mechanical step scanner. 3,985,420, Cl. 350-7.000.

Grossman, David G., to Corning Glass Works. Spontaneously-formed fluormica glass-ceramics. 3,985,531, Cl. 65-33.000.

Grossman, David G., to Corning Glass Works. Spontaneously-formed celsian glass-ceramics. 3,985,532, Cl. 65-33.000.

Grossman, David G., to Corning Glass Works. Spontaneously-formed beta-spodumene glass-ceramics. 3,985,533, Cl. 65-33.000.

Grot, Walther Gustav, to Du Pont de Nemours, E. I., and Company. Ion-exchange fabric of fluorinated polymer containing pendant side chains with sulfonyl groups. 3,985,501, Cl. 8-115.500.

Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, to Henkel & Cie G.m.b.H. Anaerobically hardening adhesives and sealants containing organic disulfonamides. 3,985,943, Cl. 526-328.000.

Gruetzmacher, Gordon D.: *See—*
Gassman, Paul G.; and Gruetzmacher, Gordon D., 3,985,756.

Grumman Corporation: *See—*
Horak, Charles R., 3,985,024.

Gruppo Lepetit S.p.A.: *See—*
Fontanella, Luigi; and Mariani, Luigi, 3,985,811.

GTE Automatic Electric Laboratories Incorporated: *See—*
Jusinskas, Julius, Jr.; and Langsdorf, Lloyd L., 3,985,974.
Valassis, John G.; Holden, James R.; and Mehta, Madhukumar A., 3,986,170.

GTE Sylvania Incorporated: *See—*
deVos, Hendrik A. J.; and Labouliere, Elzear R., 3,986,019.
Field, Robert G.; and Mason, Marvin S., 3,985,965.
Smith, Charles W.; and Dyer, Mahlon D., 3,985,442.

GTE Telecomunicazioni S.p.A.: *See—*
Tirro, Sebastiano; Cafissi, Roberto; and Cavalieri d'Oro, Enzo, 3,986,123.

Guangorena, Jesus, to Barient Company. Self tailing winch. 3,985,340, Cl. 254-150.00R.

Guido, Paul Vincent; and Criswell, Robert Lenox, to Foster Wheeler Energy Corporation. Furnace pressure control. 3,985,294, Cl. 236-15.00C.

Guillot, Jack, to Bennes Marrel, Zone Industrielle. Rotary heat exchanger, in particular for a gas turbine. 3,985,181, Cl. 165-8.000.

Guimbretiere, Jean Gerard, to Association du Centre de Transfusion Sanguine et de Dessiccation du Plasma. Apparatus for coloring slides. 3,985,096, Cl. 118-58.000.

Guisti, Richard E. Leveling device. 3,984,919, Cl. 33-381.000.

Gulf & Western Manufacturing Company (Hastings): *See—*
Weirick, Richard A.; and Donihue, Jerry L., 3,985,981.

Gundlach, Robert W., to Xerox Corporation. Migration imaging member with fusible particles. 3,985,560, Cl. 96-1.500.

Guth, Lauren W., deceased (by Guth, Margaret DeGaris, heir), to General Electric Company. Door latch control means for a dishwasher. 3,985,023, Cl. 70-267.000.

Guth, Margaret DeGaris, heir: *See*—
Guth, Lauren W., deceased, 3,985,023.

Gutierrez, Eddie N.; and Reardon, Robert C., Jr., to Lever Brothers Company. Process for the preparation of selectively halogenated ketones and ketals. 3,985,808, Cl. 260-586.00R.

Gutzmer, David I.: *See*—
Rowell, Roger M.; and Gutzmer, David I., 3,985,921.

Hachiya, Takeo; and Hagiya, Keiichi, to Hitachi, Ltd. Spinning reserve device for a water-wheel. 3,985,464, Cl. 415-1.000.

Hackett, Clarence Bertram; Jack, James; and Reynolds, Richard Paton, to Imperial Chemical Industries Limited. Surface-inhibited propellent charge. 3,985,592, Cl. 149-4.000.

Hackett, Kenneth R., to Sontrix, Inc. Multi-zone intrusion detection system. 3,986,182, Cl. 340-258.00A.

Hagen, Kenneth G.; Huffman, Fred N.; and Ruggles, Arthur E., to Thermo Electron Corporation. Annular tidal regenerator heat engine. 3,984,982, Cl. 60-520.000.

Hagiya, Keiichi: *See*—
Hachiya, Takeo; and Hagiya, Keiichi, 3,985,464.

Haglund, Bo Gustav: *See*—
Edstrom, Nils Herbert; and Haglund, Bo Gustav, 3,986,120.

Hahn, Oscar W., to McGinnes Manufacturing Company. Hydraulic apparatus for grab device. 3,985,384, Cl. 294-88.000.

Hain, Edward: *See*—
Better, Bernard R.; and Hain, Edward, 3,985,368.

Hajos, Zoltan George, to Hoffmann-La Roche Inc. Stereospecific total steroidal synthesis via substituted C/D-trans indanones. 3,985,733, Cl. 260-240.00G.

Halcon International, Inc.: *See*—
Kollar, John, 3,985,795.

Hale, Richard A., to International Harvester Company. Hand and foot governor control system. 3,985,040, Cl. 74-482.000.

Hall, John L.; and Pataky, Gilbert A., to Bendix Corporation, The. Fan clutch drive. 3,985,214, Cl. 192-91.00A.

Hallal, Eugene A. Automatic thread cutting device. 3,985,463, Cl. 408-116.000.

Haller, Pierre: *See*—
Klar, Erich; Spillekothen, Hans-Gerd; and Haller, Pierre, 3,986,032.

Hamano, Nobuo, to Tomy Kogyo Co., Inc. Simulated baseball game. 3,985,358, Cl. 273-89.000.

Hamilton, Brian K.: *See*—
Lewis, Donald J.; and Hamilton, Brian K., 3,985,375.

Hamilton, Charles W., Jr.: *See*—
Rice, Robert D.; Bossler, Thomas H.; and Hamilton, Charles W., Jr., 3,985,863.

Hamilton, Robert E. Flyswatter device. 3,984,937, Cl. 43-137.000.

Hamilton, Thomas Allan. Novel technique for frequency detection utilizing switching filters. 3,986,112, Cl. 324-78.00R.

Hammann, Ingeborg: *See*—
Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, 3,985,874.

Hammond, Paul L.: *See*—
Friel, John P.; and Hammond, Paul L., 3,985,642.

Hamner, Glen P.: *See*—
Arey, William F., Jr.; Hamner, Glen P.; and Sawyer, Willard H., 3,985,684.

Handa, Kenichi: *See*—
Nagashima, Toshio; Nakaguchi, Mitsuharu; Tsukamoto, Takuzo; Okada, Ryuzo; Kito, Hidetoshi; and Handa, Kenichi, 3,985,099.

Hansen, Aage A.; and Lane, Ralph D., to International Business Machines Corporation. High voltage integrated driver circuit. 3,986,054, Cl. 307-270.000.

Hansen, Lloyd Frank: *See*—
Corey, Howard Seebree, Jr.; Barringer, William Charles; and Hansen, Lloyd Frank, 3,985,868.

Hara, Toshitsugu; Uchida, Motokazu; Yanadori, Michio; and Kashiwabara, Yasushige, to Hitachi, Ltd. Heat transfer device. 3,985,182, Cl..165-32.000.

Hardouin, Jean-Claude Henri Raoul: *See*—
Cabut, Louis Antoine; Hardouin, Jean-Claude Henri Raoul; Huille, Michel Ernest Antoine; and Pigasse, Daniel Francois Xavier, 3,985,570.

Hare, John E., to Firetrol, Inc. Watt-hour counter. 3,986,114, Cl. 324-94.000.

Hargraves, David P., to Emerson Electric Co. Four-way valve. 3,985,154, Cl. 137-625.290.

Harmon, Paul V., to Precision Parts Corporation. Hydraulically operated disappearing stairway. 3,985,202, Cl. 182-79.000.

Harnisch, Horst, to Bayer Aktiengesellschaft. Oxazolyl-acetic acid derivatives and oxazolyl-coumarines. 3,985,763, Cl. 260-307.00D.

Harper, John W.; and Kay, Thomas D. Selective shielding device for scintiphotography. 3,986,036, Cl. 250-515.000.

Harris Corporation: *See*—
Mason, Donald R., 3,985,590.

Harris, Donald L., to Cordis Corporation. Dual pressure valve for use in ventricular shunt system. 3,985,140, Cl. 128-350.00V.

Harris, Douglas H.; and Rosenbaum, Fred J., to United States of America, Air Force. High power reciprocal co-planar waveguide phase shifter. 3,986,149, Cl. 333-31.00R.

Harris, Robert L., to Niemand Bros. Inc. Electrical insulator including a polymeric resin foam forming composition and method of insulation. 3,985,951, Cl. 174-138.00F.

Harrison, Jonas P., to Chevron Research Company. Vanadium-phosphorus oxide oxidation of N-butane to maleic anhydride. 3,985,775, Cl. 260-346.80A.

Hart, Edward J.; Leeman, James E.; MacDougall, Hugh R.; Marron, John J.; and Smith, Calvin C., to United States of America, Energy Research and Development Administration. Power supply. 3,985,078, Cl. 102-70.20R.

Hart, LeRoy, to Emhart Industries, Inc. Door lock mounting means. 3,985,008, Cl. 70-224.000.

Hartman, William Law, to Procter & Gamble Company, The. Scouring compositions. 3,985,668, Cl. 252-99.000.

Hartmann, Heinrich: *See*—
Hecker, Wolfgang; Schmedemann, Walter; and Hartmann, Heinrich, 3,986,090.

Hartung, Kuhn & Co. Maschinenfabrik GmbH: *See*—
Schulte, Fritz, 3,985,245.

Hartz, Helmut. Elastic joint component. 3,985,000, Cl. 64-12.000.

Hartzler, Harold Eugene: *See*—
Buckler, Robert Thomas; Hartzler, Harold Eugene; and Hayao, Shin, 3,985,765.

Haruki, Tatsuro, to Shimadzu Seisakusho Ltd. Chromatograph. 3,985,016, Cl. 73-23.100.

Haruta, Yashuhiko: *See*—
Matsudaira, Tadashi; Watanabe, Tadashi; Haruta, Yashuhiko; and Takagi, Teiitsu, 3,985,698.

Harvey, George Arthur, to U.M.E.C.-Boydell (Belting) Limited. Conveyor belt. 3,985,224, Cl. 198-851.000.

Harvey Hubbell Incorporated: *See*—
Hoffman, Ernest Gerhard, 3,985,412.

Harwick, Duane H.; and Schardt, Michael M., to General Motors Corporation. Brake fluid level sensing system. 3,985,985, Cl. 200-81.400.

Hasegawa, Yoshisuke, to Mitsubishi Corporation. Process for treatment of fish meat to produce raw material for production of powdered fish meat retaining fresh meat activity. 3,985,903, Cl. 426-257.000.

Hashimoto, Kazunori: *See*—
Tanaka, Satoru; Hashimoto, Kazunori; Watanabe, Hideaki; and Munakata, Keiichi, 3,985,779.

Hashimoto, Masahisa: *See*—
Hayashi, Kouji; Hashimoto, Masahisa; Nakamura, Kiyoshi; Shimizu, Masanao; Hatano, Naonobu; and Takeyama, Kunihiko, 3,985,875.

Hashimoto, Nobuyoshi; Yoshimura, Kiyotaka; Asano, Shiro; Honda, Tadatoshi; and Tsuchiya, Ryozi, to Mitsui Toatsu Chemicals, Incorporated. Process for continuously manufacturing acrylamide. 3,985,806, Cl. 260-561.00N.

Haskett, Philip R.; Bauer, Donald J.; Elges, Carl H., III; and Lindstrom, Roald E., to United States of America, Interior. Recovering copper values from oxidized ores. 3,985,855, Cl. 423-27.000.

Hassler, Heinrich; and Schreiner, Horst, to Siemens Aktiengesellschaft. Telluride containing impregnated electric contact material. 3,985,512, Cl. 29-182.100.

Hatano, Naonobu: *See*—
Hayashi, Kouji; Hashimoto, Masahisa; Nakamura, Kiyoshi; Shimizu, Masanao; Hatano, Naonobu; and Takeyama, Kunihiko, 3,985,875.

Hauer, Jean Claude Victor: *See*—
Oger, Jacques Francois; and Hauer, Jean Claude Victor, 3,984,956.

Haug, John E.: *See*—
Norris, Terry O.; Aubey, Rolland A.; and Haug, John E., 3,985,927.

Haug, Werner: *See*—
Baitinger, Utz; Najmann, Knut K.; and Haug, Werner, 3,986,173.

Haugwitz, Rudiger D.: *See*—
Narayanan, Venkatachala L.; and Haugwitz, Rudiger D., 3,985,755.

Hauni-Werke Korber & Co., KG: *See*—
Broscheit, Wolfgang; Schwarz, Peter; and Wochnowski, Waldemar, 3,985,145.

Hauschild, Ulrich; Holst, Rudolf; Kaspers, Hans-Heinz; and Rotger, Heinrich, to Kali-Chemie Aktiengesellschaft. Process for making calcined alkali phosphates of high citrate solubility for use as fertilizers. 3,985,537, Cl. 71-34.000.

Hawkins, Harold M., to Phillips Petroleum Company. Method and apparatus for conducting fermentation. 3,985,622, Cl. 195-142.000.

Hawkins, James B.: *See*—
Van Doorn, Donald W.; Williams, Roy T.; and Hawkins, James B., 3,985,072.

Hayao, Shin: *See*—
Buckler, Robert Thomas; Hartzler, Harold Eugene; and Hayao, Shin, 3,985,765.

Hayashi, Kouji; Hashimoto, Masahisa; Nakamura, Kiyoshi; Shimizu, Masanao; Hatano, Naonobu; and Takeyama, Kunihiko, to Dainippon Pharmaceutical Co., Ltd. ω-(N-acylamino)alkylphosphoryl ethanolamines, pharmaceutical compositions containing them, and their uses. 3,985,875, Cl. 424-211.000.

Hazlett, John R.; and Holstius, Elvin A., to Burroughs Wellcome Co. Chemotherapeutic solutions containing a sulphur and a salt of a 2,4-diamino-5-benzylpyrimidine. 3,985,876, Cl. 424-229.000.

Heckel, Klaus: *See*—
Kurtze, Gunther; and Heckel, Klaus, 3,985,198.

Hecker, Wolfgang; Schmedemann, Walter; and Hartmann, Heinrich, to U.S. Philips Corporation. Motor drive for a part in an X-ray apparatus. 3,986,090, Cl. 318-488.000.

Hedlund, Bo Pauls Sigvald; and Jullig, Magnus Adolf Wilhelm Peter, to AB ASSA. Lubricating system. 3,985,205, Cl. 184-1.00E.

Heick, Robert Bruce: *See—*
Colton, John Robert; Heick, Robert Bruce; and Mann, Henry, 3,985,967.

Heindrijckx, Jan: *See—*
Argurio, Federico; Borsatti, Mario; and Heindrijckx, Jan, 3,985,833.

Heinsohn, Howard H., Jr.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 3,985,907.
Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 3,985,908.

Heinzelman, Edward, Jr.: *See—*
Chan, Francis Chee Keung; and Heinzelman, Edward, Jr., 3,985,584.

Held, Byron G.: *See—*
Hoffmann, Hermann; Held, Byron G.; Green, Harry E.; and Van Essen, Harold E., 3,985,724.

Hellenbrand, Samuel H., to International Telephone and Telegraph Corporation. Heart detective. 3,985,121, Cl. 128-2.00K.

Helton, Eugene L.; and Miller, Walter B., to Caterpillar Tractor Co. Multi-material ripper tip. 3,984,910, Cl. 29-420.000.

Helversen, Frederick D.: *See—*
Petermann, James P.; Helversen, Frederick D.; and Thomas, Jack A., 3,985,572.

Hemmer, Nicholas Howard, Jr.; and Valakos, Agis Demetrius, to International Business Machines Corporation. Emergency communication system. 3,986,119, Cl. 325-3.000.

Hendricks, Charles D.: *See—*
Turnbull, Robert J.; Foster, Christopher A.; and Hendricks, Charles D., 3,985,841.

Hendry, James W., to Ex-Cell-O Corporation. Adjustable manifold and nozzle assembly for foam molding machines. 3,985,486, Cl. 425-248.000.

Henkel & Cie G.m.b.H.: *See—*
Berg, Markus; Hoffmeister, Jurgen; Jakobi, Gunter; and Krings, Peter, 3,985,670.
Glasl, Johann; Kreienfeld, Gunter; and Kroke, Hermann, 3,985,541.
Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,985,943.

Hennenfent, Douglas Joseph: *See—*
Beecroft, Harold James; Burniece, Thomas Francis, III; and Hennenfent, Douglas Joseph, 3,986,209.

Henrick, Clive A.: *See—*
Labovitz, Jeffery N.; and Henrick, Clive A., 3,985,813.

Henriksen, Niels Juul: *See—*
Beierholm, Hans Mogens; and Henriksen, Niels Juul, 3,986,100.

Herb, Carl C., to Carrier Corporation. Mounting assembly for air conditioning terminals. 3,985,068, Cl. 98-40.00D.

Hermann Berstorff Maschinenbau GmbH: *See—*
Hoffmann, Manfred, 3,985,488.

Hermann Hemscheidt Maschinenfabrik: *See—*
Bull, Hans, 3,985,328.

Herold, Ludwig; Pikorz, Wolfgang; and Sonntag, Alois, to Licentia Patent-Verwaltungs-G.m.b.H. High output wafer-shaped semiconductor component with plastic coating. 3,986,201, Cl. 357-79.000.

Herr, John Addison; and Porter, Oswald Mead, to Singer Company, The. Safety lockout system for sewing machines. 3,985,087, Cl. 112-158.00R.

Herrmann, Edgar R. Manhole cover lifter. 3,985,338, Cl. 254-131.000.

Herzlinger, George A.; Federico, Armando; and Kantrowitz, Arthur R., to Avco Everett Research Laboratory, Inc. Method and means for monitoring cardiac output. 3,985,123, Cl. 128-2.05F.

Herzog, Alexis; and Brechbuehler, Hans Ulrich, to Ciba-Geigy Corporation. Azido-s-triazine insecticides. 3,985,877, Cl. 424-249.000.

Hewlett-Packard Company: *See—*
Cochran, David S., 3,986,186.
Poole, John S.; Muhlestein, H. Blair; Smith, Douglas H.; and Bilen, Lennart, 3,986,011.
Vifian, Hugo, 3,986,113.

Hicks, Billy R., to Continental Can Company, Inc. Six-cell box divider. 3,985,286, Cl. 229-15.000.

Hicks, Clive William Frederick, to Imperial Chemical Industries Limited. Oriented films from high acrylonitrile polymer compositions. 3,985,827, Cl. 260-876.00R.

Hicks, George O. Safety device for lint cleaners. 3,984,896, Cl. 19-.230.

Hicks, Gordon C.; and Lancaster, Fred E., Jr., to Tennessee Valley Authority. Pipe reactor-continuous ammoniator process for production of granular phosphates. 3,985,538, Cl. 71-34.000.

Higgins, Frank: *See—*
Boorujy, Edward J.; Boorujy, Thomas P.; and Higgins, Frank, 3,985,502.

Hildebrand, Mark L.; Rudkin, Henry A., Jr.; and Wiley, Nathaniel C., Jr., to Rudkin-Wiley Corporation. Modular building units. 3,984,950, Cl. 52-79.000.

Hillman, Alice Lilian, executrix: *See—*
Hinchcliffe, Dennis; Rowlands, Tom; and Hillman, James George Edward, deceased, 3,985,252.

Hillman, James George Edward, deceased: *See—*
Hinchcliffe, Dennis; Rowlands, Tom; and Hillman, James George Edward, deceased, 3,985,252.

Himes, Glenn Roy, to Shell Oil Company. Dry blending and molding process. 3,985,702, Cl. 260-33.6AQ.

Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion. 3,985,563, Cl. 96-69.000.

Hinchcliffe, Dennis; Rowlands, Tom; and Hillman, James George Edward, deceased (by Hillman, Alice Lilian, executrix), to Molins Limited. Feeding rod-like articles. 3,985,252, Cl. 214-302.000.

Hindman, Milo F. Roof. 3,984,951, Cl. 52-90.000.

Hinman, Walter L., Jr.; and Gonnam, Russell W., to Westinghouse Electric Corporation. Offset keying technique for segregated phase comparison relaying. 3,986,079, Cl. 317-27.00R.

Hirai, Akiyoshi; Ishikawa, Masakazu; Ito, Sadayoshi; and Noguchi, Takeshi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Sumitomo Denki Kogyo K.K. Brake assembly wear detector. 3,986,164, Cl. 340-52.00A.

Hirata, Hiromasa: *See—*
Kono, Yasumasa; Miyahara, Shuji; Nomura, Susumu; Ohkubo, Hiroyuki; Fujimori, Yoshio; Iwawaki, Akira; and Hirata, Hiromasa, 3,984,943.

Hitachi Cable, Ltd.: *See—*
Yamaji, Kenkichi; Oelhschlagel, Dietrich; and Abe, Hajime, 3,985,280.

Hitachi Electronics, Ltd.: *See—*
Morita, Takahiko, 3,986,102.

Hitachi, Ltd.: *See—*
Fujiwara, Mitsuo; Tamura, Hifumi; and Kondo, Toshio, 3,986,025.
Hachiya, Takeo; and Hagiya, Keiichi, 3,985,464.
Hara, Toshitsugu; Uchida, Motokazu; Yanadori, Michio; and Kashiwabara, Yasushige, 3,985,182.
Kobayashi, Yoshiki; Bandoh, Tadaaki; Ide, Jushi; and Kamiuchi, Toshiro, 3,986,169.

Hitachi Shipbuilding and Engineering Co., Ltd.: *See—*
Oda, Noriyuki; Yoshida, Takashi; Nakanishi, Takeshi; Yoshikawa, Kensuke; Adachi, Akira; Ueda, Jitsuhiko; and Mizota, Toshihiro, 3,985,866.

Hitchcock, Robert D., to United States of America, Navy. Passive solar tracking system for steerable Fresnel elements. 3,986,021, Cl. 250-203.00R.

Ho, Ernest C., to Hughes Aircraft Company. Digital watch with liquid crystal and light emitting diode displays. 3,984,973, Cl. 58-50.00R.

Hobart Corporation: *See—*
Berner, George J., 3,985,603.
Treiber, Fritz F.; and Margraf, Dallas A., 3,985,605.

Hocker, Jurgen; Diehr, Hans-Joachim; and Merten, Rudolf, to Bayer Aktiengesellschaft. Carbamic acid esters. 3,985,789, Cl. 260-472.000.

Hodge, Norman J.; and Bridwell, John W., to Caterpillar Tractor Co. Automatically engaged emergency parking brake. 3,985,210, Cl. 188-170.000.

Hoechst Aktiengesellschaft: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,985,498.
Buhr, Gerhard; and Steppan, Hartmut, 3,985,566.
Dennhardt, Werner; and Schroter, Herbert, 3,985,440.
Dransch, Gunter Karl Wilhelm Otto, deceased; Wiesenhutter, Annelise Klara Helene, heiress; and Flersheim, Johanna Mathilde, heiress, 3,985,762.
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 3,985,800.
Kleber, Rolf; and Wetzel, Sigurd, 3,985,939.
Lederer, Michael; Strobel, Wolfgang; and Jastrow, Horst, 3,985,824.
Ribka, Joachim; Rieper, Wolfgang; and Zunker, Reinhard, 3,985,725.
Stenzel, Jurgen, 3,985,683.
von Halasz, Sigmar-Peter; and Kluge, Friedhelm, 3,985,810.

Hoehn, Hans, to E. R. Squibb & Sons, Inc. Amino derivatives of 6-phenylisoxazolo[5,4-b]pyridines. 3,985,760, Cl. 260-296.00H.

Hoehn, Hans: *See—*
Denzel, Theodor; and Hoehn, Hans, 3,985,757.

Hoesch Werke Aktiengesellschaft: *See—*
Klein, Konrad; Wladika, Hans; and Sevenich, Theodor, 3,985,313.

Hofacker, David A., to Minnesota Mining and Manufacturing Company. Method of introducing microporosity into membranes and making capsules having microporous capsule walls. 3,985,840, Cl. 264-4.000.

Hofbauer, Peter, to Volkswagenwerk Aktiengesellschaft. Rotary internal combustion engine with valved inlet through piston. 3,985,476, Cl. 418-61.00B.

Hoffman, Ernest Gerhard, to Harvey Hubbell Incorporated. Grounding electrical adapter. 3,985,412, Cl. 339-14.0RP.

Hoffman, Garry S.: *See—*
Carter, Donald J.; Hoffman, Garry S.; and Smith, Thomas M., 3,986,084.

Hoffman Information Identification Inc.: *See—*
Paul, John C., 3,986,167.

Hoffman, Neil R.; and Jansen, Johannes Hans, to Brake Engineering, Inc. Disc brake apparatus suitable for bicycles. 3,985,391, Cl. 301-6.00V.

Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. O-[1-Alkyl- or-phenyl-5-alkylmercaptoalkyl-mercapto-1,2,4-triazol(3)yl]-(thiono)-phosphoric(phosphonic, phosphinic) acid esters and ester-amides. 3,985,874, Cl. 424-200.000.

Hoffmann, Hermann; Held, Byron G.; Green, Harry E.; and Van Essen, Harold E., to Salsbury Laboratories. 1-(4'-Diazoniumphenyl)-pyridinium salts and the process of preparation. 3,985,724, Cl. 260-141.000.

Hoffmann-La Roche Inc.: *See—*
Dostert, Philippe, 3,985,895.
Edenhofer, Albrecht; Spiegelberg-Schoop, Hans, deceased; Spiegelberg, Annemarie, heiress; Spiegelberg-Schoop, Anna, heiress; and Spiegelberg-Von der Crone, Hans, heir, 3,985,785.
Gardner, John Nicholson, 3,985,817.
Hajos, Zoltan George, 3,985,733.
Jaffe, Gerald Myer; and Weinert, Peter Hans, 3,985,815.
Saucy, Gabriel; and Scott, John William, 3,985,771.
Surmatis, Joseph Donald, 3,985,734.

Hoffmann, Manfred, to Hermann Berstorff Maschinenbau GmbH. Material guide jaw for two co-operating rolls of a rolling mill or calender. 3,985,488, Cl. 425-363.000.

Hoffmeister, Jurgen: *See—*
Berg, Markus; Hoffmeister, Jurgen; Jakobi, Gunter; and Krings, Peter, 3,985,670.

Hofmann, Corris Mabelle; and Safir, Sidney Robert, to American Cyanamid Company. Para-fluorobenzoylpropyl-N-heterocyclic substituted quaternary salts. 3,985,754, Cl. 260-294.80D.

Hogan, Gerard T., to UOP Inc. Vertically adjustable seat with energy absorbing means. 3,985,388, Cl. 297-216.000.

Hohne, Karl, to Siemens Aktiengesellschaft. Method for the generation of hydrogen. 3,985,865, Cl. 423-657.000.

Holcombe, Cressie E., Jr.: *See—*
Powell, George L.; and Holcombe, Cressie E., Jr., 3,985,551.

Holden, James R.: *See—*
Valassis, John G.; Holden, James R.; and Mehta, Madhukumar A., 3,986,170.

Holland, Donald R.; and Steinberg, Mitchell I., to Eli Lilly and Company. Method for treating cardiac insufficiency with antibiotic A-23187. 3,985,893, Cl. 424-272.000.

Hollandse Signaalapparaten B.V.: *See—*
Tijsma, Sjoerd; and Spenkelink, Gerrit Johan Hendrik, 3,986,092.

Holley, William J.: *See—*
Post, Lloyd D.; Holley, William J.; Kosonocky, Stephan; and Dineen, John J., 3,985,079.

Holmes, Duane C., to American Optical Corporation. Stereo scanning microprobe. 3,986,027, Cl. 250-310.000.

Holst, Rudolf: *See—*
Hauschild, Ulrich; Holst, Rudolf; Kaspers, Hans-Heinz; and Rotger, Heinrich, 3,985,537.

Holstein, Arthur G., to Pfanstiehl Laboratories, Inc. Toothpastes. 3,985,870, Cl. 424-57.000.

Holstius, Elvin A.: *See—*
Alvan, George E.; and Holstius, Elvin A., 3,985,873.
Hazlett, John R.; and Holstius, Elvin A., 3,985,876.

Holtz, Leonard, to Turn-Up, Inc. Rotatable hanging device with openable suspension member. 3,985,327, Cl. 248-318.000.

Hom, Felix: *See—*
Medawar, George E.; and Hom, Felix, 3,984,974.

Homeyer, Bernhard: *See—*
Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, 3,985,874.

Honda, Tadatoshi: *See—*
Hashimoto, Nobuyoshi; Yoshimura, Kiyotaka; Asano, Shiro; Honda, Tadatoshi; and Tsuchiya, Ryozi, 3,985,806.

Honeywell Information Systems, Inc.: *See—*
Elmer, Ben R.; and Tchon, Wallace E., 3,986,172.
Elmer, Ben R.; and Tchon, Wallace E., 3,986,179.

Hong, Ju-Hi J.: *See—*
Gindi, Abraham M.; Hong, Ju-Hi J.; and Stelzenmuller, William K., 3,986,126.

Hongu, Masayuki; and Kawakami, Hiromi, to Sony Corporation. Transistor biasing circuit. 3,986,058, Cl. 307-296.000.

Hongu, Masayuki; and Tada, Masahiro, to Sony Corporation. Variable reactance circuit including differentially-connected transistor device providing a variable reactance input impedance. 3,986,145, Cl. 332-16.00T.

Honshu Paper Company, Ltd.: *See—*
Matsumura, Hisashi; Samejima, Tadanori; Orito, Hiroshi; and Ochiai, Hisashi, 3,984,898.

Hood, Arthur John: *See—*
Johnson, Martin Robert; and Hood, Arthur John, 3,985,004.

Hoose, John Frederick: *See—*
Soures, John Michael; and Hoose, John Frederick, 3,986,130.

Hoover, John R. E.: *See—*
Dunn, George L.; and Hoover, John R. E., 3,985,739.

Hora, Charles J.; and Babinsky, Andrew D., to Diamond Shamrock Corporation. Pretreatment and start-up of electrolytic cell membranes. 3,985,631, Cl. 204-98.000.

Horak, Charles R., to Grumman Corporation. Acoustic emission process and system for improved flaw source location. 3,985,024, Cl. 73-71.400.

Horiike, Yoshio: *See—*
Ohkubo, Tsuneo; and Horiike, Yoshio, 3,985,964.

Horn, George M., to United States of America, Navy. Air dropped sonobuoy. 3,986,159, Cl. 340-2.000.

Horst, William R.: *See—*
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Hoshino, Mitsuru: *See—*
Suzuki, Masayasu; Hoshino, Mitsuru; and Ohya, Masaki, 3,985,942.

Hou, Shou L.; and Taucher, Kenneth F., to Addressograph Multigraph Corporation. Modulator screen drum assembly. 3,985,432, Cl. 355-3.00R.

Houlihan, William H.; and Nadelson, Jeffrey, to Sandoz, Inc. Substituted 7,12-methano dibenzazocines. 3,985,729, Cl. 260-239.00D.

Houlihan, William J., to Sandoz, Inc. 2-Fluoro-6-trifluoromethylbenzoic acid. 3,985,799, Cl. 260-515.00A.

Houlton, Michael Richard; Jones, Gordon Robert; and Shaw, Norman, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Pyroelectric materials and devices. 3,985,685, Cl. 252-521.000.

Howe-Baker Engineers, Inc.: *See—*
Childree, Herman Travis, 3,985,494.

Howe, Robert Leslie: *See—*
Trone, Elmer; and Howe, Robert Leslie, 3,985,509.

Howell, Edward K., to General Electric Company. Negative impedance network. 3,986,152, Cl. 333-80.00T.

Hoyt, John M.; Koch, Karl; and Williams, Mathew, Jr., to National Distillers and Chemical Corporation. Process for the controlled alcoholysis of ethylene-vinyl ester interpolymers. 3,985,719, Cl. 526-10.000.

Hrovat, Milan: *See—*
Huschka, Hans; Rachor, Lothar; Hrovat, Milan; and Wolff, Willi, 3,985,844.

Huang, Kwang-Ta, to United States of America, Navy. Transient direction detector. 3,986,115, Cl. 324-102.000.

Huang, Kwang-Ta: *See—*
Smith, Maurice N.; and Huang, Kwang-Ta, 3,986,116.

Huch, Albert: *See—*
Lubbers, Dietrich W.; and Huch, Albert, 3,985,633.

Hudgin, Donald E.: *See—*
Reich, Murray; and Hudgin, Donald E., 3,984,940.

Hudson, Henry C., Jr., to Shell Oil Company. Process for removing sulfur compounds from claus off-gases. 3,985,861, Cl. 423-244.000.

Hudson, Neil: *See—*
Shuck, Edward E.; and Hudson, Neil, 3,986,106.

Huene, Donald R. Device for use in protecting a patient during removal of an immobilizing cast. 3,985,129, Cl. 128-91.00A.

Huffman, Fred N.: *See—*
Hagen, Kenneth G.; Huffman, Fred N.; and Ruggles, Arthur E., 3,984,982.

Huggett, Colin E.: *See—*
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Hughes Aircraft Company: *See—*
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Ho, Ernest C., 3,984,973.
Jacob, Don M., 3,986,187.
Kuno, Hiromu John; Chang, Yu-Wen; and Siracusa, Mario, 3,986,153.
Larkin, James T., 3,985,270.

Huille, Michel Ernest Antoine: *See—*
Cabut, Louis Antoine; and Huille, Michel Ernest Antoine, 3,985,569.
Cabut, Louis Antoine; Hardouin, Jean-Claude Henri Raoul; Huille, Michel Ernest Antoine; and Pigasse, Daniel Francois Xavier, 3,985,570.

Humber, Leslie G.: *See—*
Bruderlein, Francois T.; and Humber, Leslie G., 3,985,751.

Hummel, Richard J.: *See—*
Liegel, Reinald D.; and Hummel, Richard J., 3,985,248.

Hunter, Patrick L., to North Electric Company. Power switching control circuit with enhanced turn-off drive. 3,986,052, Cl. 307-270.000.

Hupp, Gerhard; and Mader, Helmut, to Industriewerke Karlsruhe-Augsburg Aktiengesellschaft. Firearm construction. 3,985,062, Cl. 89-159.000.

Hurlburt, Russell T. Random interval generators and method of behavior modification using same. 3,986,136, Cl. 331-78.000.

Hurley, Edwin J., to SCM Corporation. Ribbon cartridge for automatic typewriter function. 3,985,219, Cl. 197-151.000.

Huschka, Hans; Rachor, Lothar; Hrovat, Milan; and Wolff, Willi, to Nukem G.m.b.H. Process for the production of prismatic graphite molded articles for high temperature fuel elements. 3,985,844, Cl. 264-29.100.

Hyatt, Gilbert Peter. Illumination control system. 3,986,022, Cl. 250-205.000.

Hydrocarbon Research, Inc.: *See—*
Johnson, Clarence A.; and Volk, William, 3,985,516.
Johnson, Clarence A., 3,985,517.

Hyler, John H., to Westinghouse Air Brake Company. Automatic control of elevator height in scraper with manual setting and selection of alternate modes. 3,984,927, Cl. 37-8.000.

Hyman, Oscar E.: *See—*
Jenkins, Jon Arthur; Flatten, Orris H.; and Hyman, Oscar E., 3,985,133.

Hynd, William Christie, to Pilkington Brothers Limited. Production of glass fibers. 3,985,530, Cl. 65-1.000.

Hyun, Kun Sup, to Dow Chemical Company, The. Method for the extrusion of foam shapes. 3,985,847, Cl. 264-51.000.

I-T-E Imperial Corporation: *See—*
Mooney, Thomas; and Clark, John, 3,985,411.

Iacotti, Italo; Malgarini, Giansilvio; and Pasero, Edoardo, to Centro Sperimentale Metallurgico S.p.A. Iron ore reduction in multiple fluidized beds. 3,985,547, Cl. 75-35.000.

Ichida, Toshio: *See—*
Shimanaka, Hiroshi; Ichida, Toshio; and Kobayashi, Shigeru, 3,985,583.
Ichii, Takao: *See—*
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Ida, Hiroshi: *See—*
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Ide, Jushi: *See—*
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Idel, Vladimir Viktorovich. Grinding band saw teeth. 3,985,048, Cl. 76-43.000.
Idoni, Robert A., to Lock Technology, Inc. Method and apparatus for decoding twisting tumbler lock and twisting tumbler lock resistant thereto. 3,985,010, Cl. 70-364.00A.
Igarashi, Yuriko: *See—*
Takahashi, Masaaki; Ito, Akira; Igarashi, Yuriko; Kawada, Shichiro; Ogura, Jiro; and Ito, Ryoichi, 3,985,938.
Iizuka, Haruhiko; and Takeuchi, Yasuhisa, to Nissan Motor Co., Ltd. Skid control system. 3,985,400, Cl. 303-21.0BE.
Ikeda, Hirosaka; and Ishikawa, Masaki, to Sumitomo Electric Industries, Ltd. Lubricant-containing polymeric synthetic resin composition and process for preparing said composition. 3,985,661, Cl. 252-12.000.
Ikeda, Tadashi: *See—*
Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,985,563.
Ikegai Tekko Kabushiki Kaisha: *See—*
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Illinois Tool Works Inc.: *See—*
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Imberg, Bengt Uno; Karlsson, Kurt Hakan; and Orke, Gustav Georg, to U.S. Philips Corporation. Sealing arrangement in a microwave oven. 3,985,993, Cl. 219-10.55D.
Imed Corporation: *See—*
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Ashton, Stanley; Laithwaite, Peter; and Taylor, John Anthony, 3,985,717.
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Hackett, Clarence Bertram; Jack, James; and Reynolds, Richard Paton, 3,985,592.
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Ciccarelli, Roger N.; and Ims, Dale R., 3,985,666.
Inamorato, Jack T.; and Chirash, William, to Colgate-Palmolive Company. Liquid detergent compositions of controlled viscosities. 3,985,687, Cl. 252-551.000.
Inamoto, Yoshiaki; Nakayama, Hirokazu; and Takaishi, Naotake, to Kao Soap Co., Ltd. 2-Haloadamantyl-(1)-acetamides. 3,985,803, Cl. 260-557.00B.
Industrie Pirelli S.p.A.: *See—*
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Ingersoll-Rand Company: *See—*
Kneier, Joseph W., 3,985,409.
Inklaar, Petrus Adam, to Vasco Industries Corporation. Method to improve adhesive of polyolefin surfaces. 3,985,940, Cl. 526-22.000.
Innerfield, Irving. Method for detection of thrombosis and prethrombosis. 3,985,618, Cl. 195-103.50R.
Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf: *See—*
Cohen, Choua; Durif-Varambon, Bruno; Salle, Robert; and Sillion, Bernard, 3,985,711.
Prevost, Michel; and Vourron, Bernard, 3,985,624.
Instituto de Biologia Aplicada, S.A.: *See—*
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Ip, Anthony K. C.; and Koyanagi, Kenneth, to Atomic Energy of Canada Limited. Method and apparatus for joining appendages to a zirconium alloy member. 3,985,989, Cl. 219-9.500.
Ishihara, Takeshi: *See—*
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Ishii, Takao, to Ushio Electric Inc. Light source device. 3,986,018, Cl. 240-47.000.
Ishikawa, Masakazu: *See—*
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Iskra, Marian. Screwdriver. 3,985,170, Cl. 145-50.00A.
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Itoh, Akira, to Nippondenso Co., Ltd. Odometer for an automobile. 3,986,005, Cl. 235-96.000.
Itoh, Tsutomu, to Onoda Cement Company, Ltd. Powder painting apparatus. 3,985,297, Cl. 239-15.000.
Iwanami, Masaru: *See—*
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Iwu, Gregory Onyemauwa, to University of Guyana, a part interest. Method of treating bauxite waste red mud with acid and making construction bricks from the treated material. 3,985,567, Cl. 106-73.600.
Izumi, Sumio: *See—*
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J. M. Huber Corporation: *See—*
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Jackson, John Lambert, to John Wyeth & Brother Limited. Thiourea derivatives. 3,985,898, Cl. 424-322.000.

Jacob, Don M., to Hughes Aircraft Company. Automatic signal tracking circuit. 3,986,187, Cl. 343-7.300.

Jaffe, Gerald Myer; and Weinert, Peter Hans, to Hoffmann-La Roche Inc. Aqueous crystallization of xylitol. 3,985,815, Cl. 260-637.00R.

Jahnke, Robert H.; and Lynch, David E., to Bucyrus-Erie Company. Drill rod handling device. 3,985,189, Cl. 175-52.000.

Jakob, Peter Michael, to Colortronic Reinhard & Co., KG. Continuous compounding and mixing apparatus. 3,985,345, Cl. 259-8.000.

Jakobi, Gunter: *See—*
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James, Patricia Lesley: *See—*
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Jansen, Johannes Hans: *See—*
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Japan Tobacco & Salt Public Corporation, The: *See—*
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Jarvik, Robert K. Preformed ligatures for bleeders and methods of applying such ligatures. 3,985,138, Cl. 128-326.000.

Jastrow, Horst: *See—*
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Jenkins, Jon Arthur; Flatten, Orris H.; and Hyman, Oscar E., to Imed Corporation. IV pump. 3,985,133, Cl. 128-214.00F.

Jensen, Joseph C.: *See—*
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Jepson, John W.; Reid, Walter; and Brown, Robert A., to Acushnet Company. Golf club wood. 3,985,363, Cl. 273-173.000.

Jilek, Jiri: *See—*
Protiva, Miroslav; Jilek, Jiri; Sindelar, Karel; and Metysova, Jirina, 3,985,750.

Johansson, Folke Karl Evald: *See—*
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John, Ludwig: *See—*
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John Wyeth & Brother Limited: *See—*
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Johns-Manville Corporation: *See—*
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Johnson, Clarence A.; and Volk, William, to Hydrocarbon Research, Inc. Coal drying and passivation process. 3,985,516, Cl. 44-1.00R.

Johnson, Clarence A., to Hydrocarbon Research, Inc. Coal passivation process. 3,985,517, Cl. 44-1.00R.

Johnson, Daniel H.; Kubala, David M.; and Bennett, Roswell J., to Union Carbide Corporation. Slotted cathode collector bobbin for use in liquid cathode cell systems. 3,985,573, Cl. 429-133.000.

Johnson, Francis; and Cricchio, Renato, to Dow Chemical Company, The. Process for ring acylation of phenols. 3,985,783, Cl. 260-465.00F.

Johnson, Fred J., to Container Corporation of America. Carton and display panel. 3,985,232, Cl. 206-461.000.

Johnson & Johnson: *See—*
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Johnson, Lars. Device for displaceably supporting a load. 3,985,064, Cl. 91-413.000.

Johnson, Lawrence A.; and Beyn, Edgar J., to SCM Corporation. Condiment encapsulation by spray drying. 3,985,913, Cl. 426-650.000.

Johnson, Martin Robert; and Hood, Arthur John, to Ridley, Spriggs and Johnson Limited. Knitted briefs. 3,985,004, Cl. 66-177.000.

Johnson Matthey & Co., Limited: *See—*
Bradford, Christopher William; and Baldwin, Stephen George, 3,985,854.

Johnson, Morris A.; and Yang, Kang, to Continental Oil Company. Removal of iron from aqueous acid solutions containing iron and copper. 3,985,856, Cl. 423-43.000.

Johnson, Robert M.: *See—*
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Johnston, James J.; Angelico, Henry R.; Bedard, Walter J.; and Ruggiero, Joseph E., to Automatic Equipment Development Corporation. Method for splicing cable. 3,984,912, Cl. 29-628.000.

Johnston, James R.: *See—*
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Johnston, Lynn M.: *See—*
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Jones, Donald C.: *See—*
Del Bel, Elsio; Jones, Donald C.; and Neuworth, Martin B., 3,985,812.

Jones, Donald H.; and Ferry, William J., to Rohm and Haas Company. Methacrylate-butadiene-styrene graft polymers and process for their production. 3,985,704, Cl. 260-42.320.

Jones, Donald H.: *See—*
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Jones, Gordon Robert: *See—*
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Jones, Howard W., to Regan Offshore International, Inc. Support means for a well riser or the like. 3,984,990, Cl. 61-99.000.

Jones, Ivor; Muefler, Hans R.; Wild, Daniel; and Zafiropulo, Pitro A., to International Business Machines Corporation. Method of information transmission with priority scheme in a time-division multiplex communication system comprising a loop line. 3,985,962, Cl. 179-15.0AL.

Jones, Kenneth R., to Allis-Chalmers Corporation. Mechanical safety interlock for preventing mower operation during reverse travel. 3,984,967, Cl. 56-11.800.

Jones, Rufus S., Jr.: *See—*
Taylor, Paul D.; Conciatori, Anthony B.; and Jones, Rufus S., Jr., 3,985,679.

Jordan, Wilmer C. Methods and apparatus for improving fuel vaporization in internal combustion engines. 3,985,112, Cl. 123-122.00H.

Joubert, Darrell W.: *See—*
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Jouffray, Maurice, to Creusot-Loire. Telescopic boom for a crane. 3,985,234, Cl. 212-144.000.

Jouveinal S.A.: *See—*
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Jovick, Raymond John, to Rockwell International Corporation. Wheel mounting means. 3,985,393, Cl. 301-131.000.

Judah, Kenneth C.: *See—*
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Boehme, Detlef R.; Judah, Kenneth C.; and Munk, Miner N., 3,985,019.

Juilfs, Donald R.: *See—*
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Jullig, Magnus Adolf Wilhelm Peter: *See—*
Hedlund, Bo Pauls Sigvald; and Jullig, Magnus Adolf Wilhelm Peter, 3,985,205.

Jungmann, Axel, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor installation. 3,985,614, Cl. 176-87.000.

Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, to Automated Building Components, Inc. Automatic frame machine. 3,985,278, Cl. 227-86.000.

Jusinskas, Julius, Jr.; and Langsdorf, Lloyd L., to GTE Automatic Electric Laboratories Incorporated. Power fail monitor and transfer circuit. 3,985,974, Cl. 179-18.0AD.

K. Oras Oy: *See—*
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K-Tron Corporation: *See—*
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Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
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Kabushiki Kaisha Hokushin Denki Seisakusho: *See—*
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Kabushiki Kaisha Komatsu Seisakusho: *See—*
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Kabushiki Kaisha Suwa Seikosha: *See—*
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Kader, Reiner, to Mauser Kommanditgesellschaft. Apparatus for extruding a homogeneous tubular length of soft thermoplastic material. 3,985,490, Cl. 425-381.000.

Kagler, Edmond, Jr., to A-Z International Tool Company. Anchor and method of setting anchor. 3,984,991, Cl. 61-99.000.

Kaiser Aluminum & Chemical Corporation: *See—*
Goodrich, David G.; and John, Ludwig, 3,985,179.

Kaiser, Carl; and Wardell, Joe R., Jr., to SmithKline Corporation. 3-Substituted-4-hydroxyphenyl-2-piperidylcarbinols as β-adrenergic stimulants. 3,985,887, Cl. 424-267.000.

Kali-Chemie Aktiengesellschaft: *See—*
Hauschild, Ulrich; Holst, Rudolf; Kaspers, Hans-Heinz; and Rotger, Heinrich, 3,985,537.

Kalina, Theodore; and Marshall, Harry A., to Exxon Research and Engineering Company. Hydrogasification process. 3,985,519, Cl. 48-202.000.

Kallrath, Gottfried: *See—*
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Kamachi, Hajime: *See—*
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Kaman Sciences Corporation: *See—*
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Kamiuchi, Toshiro: *See—*
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Kamiya, Toshihiro: *See—*
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Kammerer, Manfred; and Tikart, Johann, to August Sauter GmbH. Damping or attenuation device for the stopping or arresting arrangement of a scale. 3,985,190, Cl. 177-184.000.

Kamyr Valves, Inc.: *See—*
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Kanai, Kenji: *See—*
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Kanazawa, Seiichiro; and Yano, Takeshi, to Nippon Electric Company, Ltd. Electromechanical branching filter. 3,986,151, Cl. 333-71.000.

Kannady, Francis W.: *See—*
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Kannady, James W.; Kannady, Francis W.; and Browning, Charles W., to Kannady, James W. Large hay bale carrier. 3,985,253, Cl. 214-506.000.

Kansai Paint Company, Ltd.: *See—*
Matsudaira, Tadashi; Watanabe, Tadashi; Haruta, Yashuhiko; and Takagi, Teiitsu, 3,985,698.

Kantrowitz, Arthur R.: *See—*
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Kao, James T. F., to Ethyl Corporation. Phosphazene composition. 3,985,834, Cl. 260-927.00N.

Kao Soap Co., Ltd.: *See—*
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Sakaguchi, Kahei; and Takemoto, Hirotaka, 3,985,664.
Sakaguchi, Kahei; Minakata, Masaaki; Takemoto, Hirotaka; and Takamori, Shigeru, 3,985,665.

Kapany, Narinder S., to Kaptron, Inc. High efficiency solar panel. 3,985,116, Cl. 126-270.000.

Kaplan, Murray Arthur; and Granatek, Alphonse Peter, to Bristol-Myers Company. Crystalline sesquihydrate of 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid. 3,985,747, Cl. 260-243.00C.

Kaptron, Inc.: *See—*
Kapany, Narinder S., 3,985,116.

Karges, Hermann Erich, to Behringwerke Aktiengesellschaft. Substrate for determining proteinase. 3,985,620, Cl. 195-103.50R.

Karklys, Joseph, to Whirlpool Corporation. Integrated circuit appliance programmer including programmer modification function. 3,986,040, Cl. 307-141.000.

Karll, Robert E.: *See—*
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Karlsson, Kurt Hakan: *See—*
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Kasch, Robert: *See—*
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Kashiwabara, Yasushige: *See—*
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Katagiri, Nobuyuki: *See—*
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Kathawala, Faizulla G., to Sandoz, Inc. Pyridine containing phenoxypivalophenone derivatives. 3,985,883, Cl. 424-263.000.

Katsui, Saburo; and Tsugei, Shinji, to Sharp Kabushiki Kaisha. Hood structure for electronic calculators. 3,986,014, Cl. 235-152.000.

Katsuoka, Ritsu: *See—*
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Katzen, Stanley J.: *See—*
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Kauffman, William J., to Armstrong Cork Company. Isocyanurate compounds. 3,985,748, Cl. 260-248.0NS.

Kaupas, Philip F.; and Bress, Dellason F., to Foster Wheeler Energy Corporation. Pollution control process for fertilizer plant. 3,985,523, Cl. 55-70.000.

Kawabata, Hidetoshi: *See—*
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Kawada, Shichiro: *See—*
Takahashi, Masaaki; Ito, Akira; Igarashi, Yuriko; Kawada, Shichiro; Ogura, Jiro; and Ito, Ryoichi, 3,985,938.

Kawai, Hisasi; and Katsuoka, Ritsu, to Nippon Soken, Inc. Fuel injection controlling system for an internal combustion engine. 3,986,006, Cl. 235-150.210.

Kawai, Ryutaro: *See—*
Murakami, Masuo; Takahashi, Kozo; Iwanami, Masaru; Fujimoto, Masaharu; Shibanuma, Tadao; Kawai, Ryutaro; and Takenaka, Toichi, 3,985,758.

Kawakami, Hiromi: *See—*
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Kawasaki Steel Corporation: *See—*
Shimanaka, Hiroshi; Ichida, Toshio; and Kobayashi, Shigeru, 3,985,583.

Kawata, Shigeo: *See—*
Yoshimura, Yoshio; Yokogawa, Kanae; and Kawata, Shigeo, 3,985,869.

Kay, Edward L., to Firestone Tire & Rubber Company, The. Smoke-retardant for chlorinated polyethylene and vinyl chloride polymers. 3,985,706, Cl. 260-45.75W.

Kay, Thomas D.: *See—*
Harper, John W.; and Kay, Thomas D., 3,986,036.

Kayser, Hans Dieter; and Dindorf, Wilhelm, to Akzona Incorporated. Device for the opening and conveyance of freshly cut staple fiber bundles. 3,985,053, Cl. 83-100.000.

Kearney & Trecker Corporation: *See—*
Zankl, Frank; Kirkham, Edward E.; Stobbe, Richard E.; and Schachte, John J., 3,986,087.
Zankl, Frank; Kirkham, Edward E.; Stobbe, Richard E.; and Schachte, John J., 3,986,088.

Kearsley, Wayne A., to Flash Technology Corporation of America. Converter circuit. 3,986,096, Cl. 321-2.000.

Keeton, J. Herbert. Fluid-filled cushioning assemblies. 3,984,886, Cl. 5-368.000.

Keil, Jurgen: *See—*
Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,985,943.

Keller, George E., II: *See—*
Albright, Charles W.; and Keller, George E., II, 3,985,820.

Keller, James J. Numbering head attachment for a printing press. 3,985,073, Cl. 101-76.000.

Keller, Wolfgang, to Siemens Aktiengesellschaft. Device and method for crucible-free zone melting of crystallizable rods in particular semiconductor rods. 3,985,947, Cl. 13-26.000.

Kelsey-Hayes Company: *See—*
Doerfler, Roger E., 3,985,986.

Kennecott Copper Corporation: *See—*
Franz, Henry W., 3,985,031.

Kennedy, Andrew P.: *See—*
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Kennicutt, Robert B.; and Mounts, William T., to Caterpillar Tractor Co. Tractor cab mounting apparatus. 3,985,385, Cl. 296-35.00R.

Kent, Bryan; and Kent, Duane, to Pulse Engineering Inc. Method for winding ring-shaped articles. 3,985,310, Cl. 242-4.00R.

Kent, Duane: *See—*
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Kern, William M., to S&S Corrugated Paper Machinery Co., Inc. Single point means for slotter adjustment. 3,985,066, Cl. 93-58.20R.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
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Kessler, Siegbert: *See—*
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Keystone International, Inc.: *See—*
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Khaikin, Boris Alexandrovich: *See—*
Baum, Sergei Alexeevich; Meshkov, Nikolai Mikhailovich; Nikolaev, Mikhail Georgievich; Osipov, Evgeny Yakovlevich; Khaikin, Boris Alexandrovich; and Dymov, Gershon Davidovich, 3,985,225.

Khan, Tasadduq: *See—*
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Kidder, David Roy, to Du Pont de Nemours, E. I., and Company. Polyamidation process by maintaining temperature and pressure differential controls. 3,985,714, Cl. 260-78.00R.

Kiemle, Horst, to Siemens Aktiengesellschaft. Device for the light-optical, computer-controlled drawing of masks for semiconductor components. 3,985,439, Cl. 355-46.000.

Kim, Chung Kyu, to Raytheon Company. Avalanche semiconductor amplifier. 3,986,142, Cl. 331-107.00R.

Kim, Keun Young, to Monsanto Company. Process for gelling aqueous polyol suspensions and resulting gel. 3,985,675, Cl. 252-317.000.

Kim, Kun Ha: *See—*
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Kimura, Shozo, to Toyo Chuo Kagaku Kenkyusho. Method for color-anodizing aluminum and aluminum alloys in a short period of time. 3,985,629, Cl. 204-58.000.

Kindersley, Peter G., to Kamyr Valves, Inc. Ball valve for valving abrasive fluids. 3,985,150, Cl. 137-240.000.

Kindscher, Wolfgang; and Oppenlaender, Knut, to BASF Aktiengesellschaft. Anticorrosive agent. 3,985,504, Cl. 21-2.70R.

King, Harold W., to Ethyl Development Corporation. Hot stamping die chase. 3,985,491, Cl. 425-384.000.

King, James R., to Eastman Kodak Company. Photographic element and process for developing. 3,985,564, Cl. 96-95.000.

King, Robert W.; and Anderson, Robert L., to Copeland Corporation. Rotary pump. 3,985,473, Cl. 417-315.000.

Kinoshita, Sadamu. Metal melting method using electric arc furnace. 3,985,545, Cl. 75-12.000.

Kirby, James D. Flush tank warning system. 3,984,877, Cl. 4-1.000.

Kirchoff, George F., Jr.: *See—*
Schneiter, Fred E.; Thompson, Arnold R.; Davis, Leland E.; and Kirchoff, George F., Jr., 3,985,076.

Kirk, Merritt C., Jr., to Sun Oil Company of Pennsylvania. High quality blended jet fuel composition. 3,985,638, Cl. 208-15.000.

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Kirkpatrick, Paul A., to General Foods Corporation. Incorporating a gas in candy. 3,985,909, Cl. 426-572.000.

Kirkpatrick, Paul A., to General Foods Corporation. Method of making a gasified confection. 3,985,910, Cl. 426-572.000.

Kirkpatrick, William James: *See—*
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Kise, Mearl A.: *See—*
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Kitagawa, Katsuichi: *See—*
Akatsuka, Takeaki; Kitagawa, Katsuichi; Amo, Hiroyoshi; and Mita, Osamu, 3,985,845.

Kitagawa, Yoshiko. Collapsible box. 3,985,285, Cl. 229-8.000.

Kito, Hidetoshi: *See—*
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Kitrilakis, Sotiris: *See—*
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Kittstein, Nicholas. Bracket device. 3,985,326, Cl. 248-226.00A.

Klar, Erich; Spillekothen, Hans-Gerd; and Haller, Pierre, to Kraftwerk Union Aktiengesellschaft. Self-powered neutron detector for external reactor instrumentation. 3,986,032, Cl. 250-390.000.

Kleber, Rolf; and Wetzel, Sigurd, to Hoechst Aktiengesellschaft. Process for the manufacture of antistatic fibers and sheets of polyacrylonitrile. 3,985,939, Cl. 526-3.000.

Klee, Richard E. High-pressure sample injection for liquid chromatography. 3,985,166, Cl. 141-346.000.

Klein, Guenther, to Vereinigte Edelstahlwerke AG. Arrangement for regulating the distillate height level in the degassing stage of an evaporation installation. 3,985,626, Cl. 202-202.000.

Klein, Konrad; Wladika, Hans; and Sevenich, Theodor, to Hoesch Werke Aktiengesellschaft. Reel system. 3,985,313, Cl. 242-78.100.

Klein, Norman E., to Deering Milliken Research Corporation. Dyeing and printing of materials. 3,985,006, Cl. 68-205.00R.

Klein, Schanzlin & Becker Aktiengesellschaft: *See—*
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Kleinhuber, Harald: *See—*
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Klemer, Zvi, to Lawrence Peska Associates, Inc., a part interest. Automatic animal feeder device. 3,985,104, Cl. 119-51.120.

Kline, Larry Harold: *See—*
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Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
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Kloster, Glenn R. Infinite sound reproduction chamber. 3,985,201, Cl. 181-163.000.

Kluge, Friedhelm: *See—*
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Klygis, Mindaugas Julius, to Illinois Tool Works Inc. Bottle carrier. 3,985,228, Cl. 206-158.000.

Kmita, Tatyana Georgievna: *See—*
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Kneier, Joseph W., to Ingersoll-Rand Company. Tackle box. 3,985,409, Cl. 312-271.000.

Knippschild, Gerd; and Schuster, Hubert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of sodium perborate. 3,985,862, Cl. 423-281.000.

Knothe, Herbert: *See—*
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Knutson, Dale A., to Applied Power Inc. Tilt cab power stream and valve control therefor. 3,985,194, Cl. 180-89.00A.

Knutson, Oliver J.: *See—*
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Kobayashi, Fukashi: *See—*
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Kobayashi, Fumio, to Ohi Mfg. Co., Ltd. Locking apparatus provided with an idle mechanism. 3,985,381, Cl. 292-216.000.

Kobayashi, Katsumi; Dohgane, Iwao; Okabe, Hiromichi; and Tanimoto, Kenji, to Sumitomo Chemical Company, Limited. Process for producing alkylnaphthalenes. 3,985,819, Cl. 260-671.00R.

Kobayashi, Shigeru: *See—*
Shimanaka, Hiroshi; Ichida, Toshio; and Kobayashi, Shigeru, 3,985,583.

Kobayashi, Yoshiki; Bandoh, Tadaaki; Ide, Jushi; and Kamiuchi, Toshiro, to Hitachi, Ltd. Device protection method and apparatus. 3,986,169, Cl. 340-146.10C.

Koberlein, Ross D.: *See—*
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Koch, Karl: *See—*
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Koehring Company: *See—*
Williamson, Gerald E.; Dickey, Wayne; and Koberlein, Ross D., 3,985,305.

Koetsch, Philip W.; and Jensen, Joseph C., to NCR Corporation. Automatic V-I crossover regulator. 3,986,101, Cl. 323-20.000.

Kogelnik, Herwig Werner, to Bell Telephone Laboratories, Incorporated. Common medium optical multichannel exchange and switching system. 3,986,020, Cl. 250-199.000.

Koguchi, Nobuyuki: *See—*
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Kohjin Co., Ltd.: *See—*
Notomi, Ryohta; Shigeyoshi, Tuyoshi; and Sugiyama, Masayoshi, 3,985,849.

Kohn, Michel Andre, to International Detection Protection. Anti-tamper automobile alarm system utilizing plural reed type switches. 3,986,166, Cl. 340-63.000.

Kohut, Michael: *See—*
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Kojima, Chiaki; Ohta, Hiroshi; and Aoki, Hidekazu, to Kabushiki Kaisha Komatsu Seisakusho. Tunnel excavator. 3,985,390, Cl. 299-31.000.

Kokusan Denki Co., Ltd.: *See—*
Kondo, Tetsuya; and Watanabe, Takeshi, 3,985,109.

Kollar, John, to Halcon International, Inc. Process for preparing glycols from their ester precursors. 3,985,795, Cl. 260-497.00R.

Komarnycky, Peter: *See—*
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Komine, Shigeharu; Tanaka, Yoshiaki; and Kuzuya, Shiro, to Oki Electric Industry Company, Ltd. Key telephone system for subscribers. 3,985,959, Cl. 179-2.0DP.

Komoto, Robert G.: *See—*
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Kondo, Tetsuya; and Watanabe, Takeshi, to Kokusan Denki Co., Ltd. Breakerless ignition system for an internal combustion engine. 3,985,109, Cl. 123-8.090.

Kondo, Toshio: *See—*
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Kono, Yasumasa; Miyahara, Shuji; Nomura, Susumu; Ohkubo, Hiroyuki; Fujimori, Yoshio; Iwawaki, Akira; and Hirata, Hiromasa, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Apparatus for treating surfaces of sheet steel or the like. 3,984,943, Cl. 51-8.00R.

Kopp, Jean Ernst. Friction overload coupling. 3,984,999, Cl. 64-30.00C.

Korner, Gerhard; and Schmitz, Wolfgang, to BBC Brown Boveri & Cie AG. Electric circuit breaker assembly. 3,985,988, Cl. 200-148.00R.

Kornfeld, Edmund C.; and Bach, Nicholas J., to Eli Lilly and Company. 6-Methyl-8-(substituted) methylergolines. 3,985,752, Cl. 260-285.500.

Kortenhaus, Dieter; and Busch, Jurgen P., to NSM Apparatebau GmbH Kommanditgesellschaft. Control system for a coin-operated musical machine. 3,985,217, Cl. 194-15.000.

Korzeniewski, Robert N. Gun sight. 3,984,917, Cl. 33-260.000.

Koske, Peter Hans; and Langbein, Gerhard, to URANIT Uran-Isotopentrennungs-GmbH. Method for controlling uranium enrichment systems. 3,986,029, Cl. 250-336.000.

Kosley, Raymond W., Jr.: *See—*
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Kosonocky, Stephan: *See—*
Post, Lloyd D.; Holley, William J.; Kosonocky, Stephan; and Dineen, John J., 3,985,079.

Kosonocky, Walter Frank, to RCA Corporation. Introducing signal at low noise level to charge-coupled circuit. 3,986,198, Cl. 357-24.000.

Kostecki, Raymond T., to United States of America, Navy. Two selector gate for active-passive radio proximity fuzes. 3,985,080, Cl. 102-70.20P.

Koster, William Henry; Slusarchyk, William A.; and Bernstein, Jack, to E. R. Squibb & Sons, Inc. 7-(α-Cyanomethylthio)acetamido-3-cephem carboxylates. 3,985,746, Cl. 260-243.00C.

Kosup, Russell R., to Unicorn Industries. Modular multipole circuit breaker with external trip control. 3,986,155, Cl. 335-36.000.

Kotzsch, Hans Joachim; and Vahlensieck, Hans Joachim, to Dynamit Nobel Aktiengesellschaft. Esterification method for trichlorosilane. 3,985,781, Cl. 260-448.80R.

Kouklik, Ivo; and Navratil, Josef, to Elitex, Zavody textilniho strojirenstvi generalni reditelstvi. Method and apparatus for monitoring the operative position data of group controlled knitting machines. 3,985,002, Cl. 66-154.00A.

Koyama, Nobuyuki: *See—*
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Kreienfeld, Gunter: *See—*
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Kress, Thomas J.; and Moore, Larry L., to Eli Lilly and Company. Process for preparing 2-amino-5-chloropyridine. 3,985,759, Cl. 260-296.00R.

Kressly, Richard H., to FMC Corporation. Method of feeding material to a conveyor belt. 3,985,222, Cl. 198-617.000.
Krings, Peter: *See—*
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Kriz, Edward F.; and Oszlanyi, Antal G., to SCM Corporation. Pastry shortening. 3,985,911, Cl. 426-602.000.
Krohn, Fritz F. W., to General Dynamics Corporation. Mast structure and composite structural fitting therefore. 3,984,962, Cl. 52-649.000.
Kroke, Hermann: *See—*
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Krug, Manfred; and Kessler, Siegbert, to SKF Industrial Trading and Development Company, B.V. Process for manufacturing an electrode for electrolytically forming a groove pattern in an arcuate surface of an article. 3,984,911, Cl. 29-424.000.
Kruglov, Igor Ivanovich: *See—*
Vodakov, Jury Alexandrovich; Lomakina, Galina Alexandrovna; Mokhov, Evgeny Nikolaevich; Kruglov, Igor Ivanovich; Ryzhikov, Igor Veniaminovich; Pavlichenko, Vadim Ivanovich; Kmita, Tatyana Georgievna; Kholuyanov, Georgy Fedorovich; Violin, Eduard Efimovich; Maslakovets, Jury Petrovich, deceased; and Valter-Maslakovets, Irina Vladimirovna, administratrix, 3,986,193.
Krukonis, Val J., to Avco Corporation. Method of depositing material on a heated substrate. 3,985,917, Cl. 427-52.000.
Krummel, H. Karl; and Gault, Terrell W., to Procter & Gamble Company, The. Detergent compositions. 3,985,669, Cl. 252-116.000.
Kubala, David M.: *See—*
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Kubo, Takashi, to Research Foundation for Microbial Diseases of Osaka University. Process for preparing live varicella vaccines. 3,985,615, Cl. 195-1.300.
Kuehnle, Manfred R., to Coulter Information Systems, Inc. Electrostatic image recording device having partially collapsible toner applicator. 3,985,437, Cl. 355-10.000.
Kuhlmann, Henry, to Deepsea Ventures, Inc. Method and apparatus for separating solid particles from a mixed fluid stream. 3,985,522, Cl. 55-52.000.
Kuhner, Ernst Ewald. Rotatory parking apparatus with means for selectively lifting pallets fixed thereto. 3,985,243, Cl. 214-16.10A.
Kulczycki, Karol; and Darsie, Burns, to Barber-Colman Company. Heddle for a weaving machine for making triaxial fabrics. 3,985,160, Cl. 139-93.000.
Kulesa, Edmund M., to Continental Can Company, Inc. Tab holddown. 3,985,261, Cl. 220-270.000.
Kulesza, Stanley; and Robison, William D., to United States of America, Army. Multi-directional firing device. 3,985,075, Cl. 102-8.000.
Kulle, Frank, to Lawrence Peska Associates, Inc., a part interest. Automobile headlight. 3,986,017, Cl. 240-41.00R.
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Kump, Ernest Joseph. Transport configuration for a modular environmental space module. 3,984,953, Cl. 52-143.000.
Kunda, Wasyl; Rudyk, Boris; and Kohut, Michael, to Sherritt Gordon Mines Limited. Process for the recovery of copper and ammonium sulphate from copper-bearing mineral sulphide ores or concentrates. 3,985,553, Cl. 75-103.000.
Kunik, I. Jordan: *See—*
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Kuniyoshi, Yasunobu; and Tsuchiya, Takao, to Sony Corporation. DC level control circuit. 3,985,954, Cl. 178-7.3DC.
Kuno, Hiromu John; Chang, Yu-Wen; and Siracusa, Mario, to Hughes Aircraft Company. Active millimeter-wave integrated circuit. 3,986,153, Cl. 333-84.00R.
Kurakin, Viktor Ivanovich: *See—*
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Kurita, Takaji, to Minolta Camera Kabushiki Kaisha. Exposure control device. 3,985,438, Cl. 355-11.000.
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Kutter, Eberhard; Austel, Volkhard; and Diederen, Willi, to Boehringer Ingelheim GmbH. 2-Phenyl-imidazo (4,5-b)pyridines and salts thereof. 3,985,891, Cl. 424-263.000.
Kuwana, Kazutaka; and Amano, Hiroyuki, to Aisin Seiki Kabushiki Kaisha. Method, circuit, and apparatus for anti-skid brake control in motor vehicles. 3,985,396, Cl. 303-21.00P.
Kuzma, Leonard J.: *See—*
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Labovitz, Jeffery N.; and Henrick, Clive A., to Zoecon Corporation. Unsaturated alcohols. 3,985,813, Cl. 260-632.00Y.
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Lamanna, Richard A.: *See—*
Tobias, Michael A.; and Lamanna, Richard A., 3,985,695.
Lamberton and Company Limited: *See—*
Goldie, William Law, 3,985,241.
Lanam, Richard D.: *See—*
Shapiro, Stanley; and Lanam, Richard D., 3,985,589.
Lancaster, Fred E., Jr.: *See—*
Hicks, Gordon C.; and Lancaster, Fred E., Jr., 3,985,538.
Land, Ronald E., to United States of America, Air Force. Universal temperature controlled reference junction. 3,986,082, Cl. 317-120.000.
Lane, Ralph D.: *See—*
Hansen, Aage A.; and Lane, Ralph D., 3,986,054.
Lang, Gerard; and Bugaut, Andree, to L'Oreal. Diazamerocyanines for dyeing keratinous fibers. 3,985,499, Cl. 8-10.100.
Langbein, Gerhard: *See—*
Koske, Peter Hans; and Langbein, Gerhard, 3,986,029.
Langsdorf, Lloyd L.: *See—*
Jusinskas, Julius, Jr.; and Langsdorf, Lloyd L., 3,985,974.
Langsley, Gerald William, to Coalite and Chemical Products Limited. Antioxidants. 3,985,710, Cl. 260-48.000.
Lankamp, Herman, to SKF Industrial Trading and Development Company, B.V. Material displaying a low coefficient of friction and low wear at high load and speed. 3,985,660, Cl. 252-12.000.
Lankford, Larry Gene; and Whittle, William Robert, to International Business Machines Corporation. Automatic tool deflection calibration system. 3,986,010, Cl. 235-151.110.
Lapeyre, James M., to Laitram Corporation, The. Solar engine. 3,984,985, Cl. 60-641.000.
Lappin, James B., Jr. Self extinguishing cigarette. 3,985,143, Cl. 131-4.00A.
Larkin, James T., to Hughes Aircraft Company. Epoxy application apparatus. 3,985,270, Cl. 222-168.000.
Larson, Charles O., to Charles O. Larson Co. Tool holder for pegboard. 3,985,324, Cl. 248-223.000.
Larson, Kay R.; Drew, John; and Ott, Howard. Electrolytic silver recovery apparatus. 3,985,634, Cl. 204-212.000.
Lattig, Gerald E. Tree stand. 3,985,204, Cl. 182-223.000.
Lausch, Henry N.: *See—*
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Lawrence, John Leslie: *See—*
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Lawrence Peska Associates, Inc.: *See—*
Albach, William N., 3,985,146.
Fox, Kenneth W., 3,985,018.
Klemer, Zvi, 3,985,104.
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Steinacher, Ken, 3,985,424.
Lawyer, Russell R.: *See—*
Clay, Frank M.; Moran, Leland G.; and Lawyer, Russell R., 3,985,483.
Lazaridis, Lazaros J.; Searight, Edward F.; and Shefsiek, Paul K., to Thermo Electron Corporation. Deep fat fryer. 3,985,120, Cl. 126-378.000.
Lear Siegler, Inc.: *See—*
McVickar, Dan B.; and Wolf, Adolf, 3,985,115.
Leas, Arnold Marcel: *See—*
Leas, Lawrence Earl; Leas, Robert Lamar; and Leas, Arnold Marcel, 3,985,548.

Leas Brothers Development Corporation: *See*—
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Leas, Lawrence Earl; Leas, Robert Lamar; and Leas, Arnold Marcel, to Leas Brothers Development Corporation. Direct metal reduction from coal. 3,985,548, Cl. 75-36.000.
Leas, Robert Lamar: *See*—
Leas, Lawrence Earl; Leas, Robert Lamar; and Leas, Arnold Marcel, 3,985,548.
Lech, Richard J.: *See*—
Virtue, Eugene P.; and Lech, Richard J., 3,985,472.
Leco Corporation: *See*—
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Lectron Products, Inc.: *See*—
Edmonston, William H., 3,985,839.
Ledbetter, Theodore N.: *See*—
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Lederer, Michael; Strobel, Wolfgang; and Jastrow, Horst, to Hoechst Aktiengesellschaft. Process for preparing impact resistant polyvinyl aromatics. 3,985,824, Cl. 260-827.000.
Lee, Roy A. Plant guard for cultivator. 3,985,186, Cl. 172-81.000.
Leeman, James E.: *See*—
Hart, Edward J.; Leeman, James E.; MacDougall, Hugh R.; Marron, John J.; and Smith, Calvin C., 3,985,078.
Lefebvre, Michel S. M.; and Davidovits, Joseph, to Omnium de Prospective Industrielle. Composite floor coverings. 3,985,925, Cl. 428-92.000.
Lefferson, Peter, to Milton Roy Company. Constant pressure pump. 3,985,467, Cl. 417-20.000.
Leffler, Nils Gustav, to Sunds Aktiebolag. Apparatus for processing liquid-containing substance mixtures, particularly cellulose pulp. 3,985,005, Cl. 68-181.00R.
Leir, Charles M.: *See*—
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Leitch, James Rodger Campbell: *See*—
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Leland Stanford Junior Unversity, The Board of Trustees of: *See*—
Collman, James P.; and Komoto, Robert G., 3,985,770.
Lemon, Robert W., to Borg-Warner Corporation. Hydraulic control system. 3,985,063, Cl. 91-31.000.
Lenoir, Fred White; and Wheeler, Bertrem Charles, to Allied Chemical Corporation. Lid for pneumatic yarn splicer. 3,984,971, Cl. 57-22.000.
Lentz, Claus: *See*—
Frankenberg, Wolfgang; and Lentz, Claus, 3,986,103.
Leonard, Ronald J.: *See*—
Carpenter, Walter L.; and Leonard, Ronald J., 3,985,135.
Lepoutre, Pierre; and Pieniak, Heinz Alfred. Slit film. 3,985,599, Cl. 156-164.000.
Lerault, Raymond; and Bulte, Jean-Claude, to Societe Lignes Telegraphiques et Telephoniques. Regeneration of signalling pulses. 3,985,970, Cl. 179-16.0EA.
Leroy, Pierre; and Sprunck, Emile, to Sprunck, Emile; and Creusot-Loire. Converter. 3,985,350, Cl. 266-218.000.
Leutwyler, Roy: *See*—
Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, 3,985,278.
Lever Brothers Company: *See*—
Gutierrez, Eddie N.; and Reardon, Robert C., Jr., 3,985,808.
Levinson, Melvin L. Microwave oven baking utensil. 3,985,990, Cl. 219-10.55E.
Levinson, Melvin L. Methods of microwave heating in metal containers. 3,985,991, Cl. 219-10.55E.
Lewis, Donald J.; and Hamilton, Brian K., to Allied Chemical Corporation. Inflation apparatus. 3,985,375, Cl. 280-737.000.
Lewis, Leon David, to Garrett Corporation, The. Gas turbine fuel delivery system. 3,985,468, Cl. 417-214.000.
Ley, Kurt: *See*—
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,985,879.
Libhart, Anthony C., to Colson Company, The. Wheel brake. 3,985,208, Cl. 188-1.00D.
Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Goll, Erwin, 3,986,066.
Herold, Ludwig; Pikorz, Wolfgang; and Sonntag, Alois, 3,986,201.
Nutz, Karl-Dieter, 3,986,143.
Liedgens, Karl. Collapsible molds and spacers therefor. 3,985,329, Cl. 249-40.000.
Liegel, Reinald D.; and Hummel, Richard J., to Badger Dynamics, Inc. Telescopic boom assembly. 3,985,248, Cl. 214-141.000.
Light, Stanley C., Jr., to Sun Shipbuilding and Dry Dock Company. Silt and pollution control for marine facility. 3,984,987, Cl. 61-1.00F.
Lin, Stephen Y., to Westvaco Corporation. Carboxymethylated materials derived from wood molasses and process for making same. 3,985,728, Cl. 536-120.000.
Lindblom, Karl-Peter Christian: *See*—
Danielsson, Nils Allan; and Lindblom, Karl-Peter Christian, 3,985,443.
Lindquist, Nils Tommy, to Aktiebolaget Electrolux. Method of constructing an electrical fitting through a passage in a non-conductive wall. 3,984,913, Cl. 29-630.00R.
Lindroos, Raimo: *See*—
Eloranta, Kalevi; Lindroos, Raimo; and Surakka, Jorma, 3,985,994.
Lindstrom, Roald E.: *See*—
Haskett, Philip R.; Bauer, Donald J.; Elges, Carl H., III; and Lindstrom, Roald E., 3,985,855.
Lindstrom, Robert D., to Lawrence Peska Associates, Inc., a part interest. Credit card validation aid. 3,985,431, Cl. 353-94.000.
Ling, Bernt: *See*—
Bylander, Magnus; and Ling, Bernt, 3,985,452.
Lingscheit, James N.; and Whalen, Thomas J., to Ford Motor Company. Seal for energy conversion devices. 3,985,576, Cl. 429-103.000.
Linn, John Charles; and Naden, Rex Alan, to Texas Instruments Incorporated. Single chip magnetic bubble processor. 3,986,016, Cl. 235-156.000.
Lipschutz, Paul, to Societe d'Exploitation des Brevets Neiman S.A. Compact anti-theft device for vehicles. 3,985,009, Cl. 70-252.000.
Lissot, Jean; and Sausse, Andre, to Rhone-Poulenc S.A. Extracorporeal blood circuit. 3,985,134, Cl. 128-214.00R.
Little Manufacturing Company: *See*—
Carter, Donald J.; Hoffman, Garry S.; and Smith, Thomas M., 3,986,084.
Litton Systems, Inc.: *See*—
True, Richard Brownell, 3,986,188.
Litz, Frank A.; Mathisen, Einar S.; Schumann, Paul A., Jr.; and Valentino, Carl R., to International Business Machines Corporation. Automatic test sample handling system. 3,985,507, Cl. 23-253.00R.
Livio, Liberatori; Ciro, Berneschi; and Lorenzo, Liberatori. Labelling machine for garments. 3,985,067, Cl. 93-88.000.
Lock Technology, Inc.: *See*—
Idoni, Robert A., 3,985,010.
Lohse, Friedrich: *See*—
Schmid, Rolf; Lohse, Friedrich; Fatzer, Willy; and Batzer, Hans, 3,985,825.
Lomakina, Galina Alexandrovna: *See*—
Vodakov, Jury Alexandrovich; Lomakina, Galina Alexandrovna; Mokhov, Evgeny Nikolaevich; Kruglov, Igor Ivanovich; Ryzhikov, Igor Veniaminovich; Pavlichenko, Vadim Ivanovich; Kmita, Tatyana Georgievna; Kholuyanov, Georgy Fedorovich; Violin, Eduard Efimovich; Maslakovets, Jury Petrovich, deceased; and Valter-Maslakovets, Irina Vladimirovna, administratrix, 3,986,193.
Longenecker, John G.; Rubio, Manuel J.; and Robustelli, Ciro M., to Barrera, Roberto Gonzales. Continuous in-feed high speed precooking machine system for the production of cooked dough foodstuffs. 3,985,070, Cl. 99-353.000.
Lonning, Thor J. G., to Monsanto Company. Polyvinyl chloride polyblend molding composition. 3,985,693, Cl. 260-23.0XA.
Loomis, Charles M. Gauge panel structure for elevator shaft rough entrance opening. 3,984,952, Cl. 52-127.000.
L'Oreal: *See*—
Lang, Gerard; and Bugaut, Andree, 3,985,499.
Lorenzo, Liberatori: *See*—
Livio, Liberatori; Ciro, Berneschi; and Lorenzo, Liberatori, 3,985,067.
Lork, Winfried: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 3,985,800.
Loshbough, Richard C.; Williams, Roger B., Jr.; and Pryor, Edward G., to Reliance Electric Company. Digital weight measuring and computing apparatus with automatic zero correction. 3,986,012, Cl. 235-151.330.
Lotus, John W.: *See*—
Castanino, Joseph J.; Lotus, John W.; and Meade, Alfred J., 3,986,184.
Lovens Kemiske Fabrik Produktionsaktieselskab: *See*—
Feit, Peter Werner, 3,985,777.
Lowe, Christopher Robin: *See*—
Dean, Peter Duncan Goodearl; and Lowe, Christopher Robin, 3,985,690.
Lu, Chin H.; and Parent, Richard A., to Xerox Corporation. Conductive inks containing quaternary ammonium compounds. 3,985,663, Cl. 252-62.10L.
Lubalin, Herbert; and Lubge, Reiner. Dispenser-cover for containers filled with granular or powdered material. 3,985,274, Cl. 222-362.000.
Lubbers, Dietrich W.; and Huch, Albert, to Eschweiler & Co. Device for the polarographic measurement of oxygen pressure. 3,985,633, Cl. 204-195.00P.
Lubge, Reiner: *See*—
Lubalin, Herbert; and Lubge, Reiner, 3,985,274.
Lucas, Howard Robert, to American Cyanamid Company. Flame-retarded acrylic multipolymer-vinyl chloride polymer compositions. 3,985,828, Cl. 260-876.00R.
Luckow, Herbert: *See*—
Brandi, Hermann Th., deceased; and Luckow, Herbert, 3,985,995.
Ludwig, Frank A., to Ford Motor Company. Secondary battery or cell with dual electrode. 3,985,575, Cl. 429-103.000.
Ludwig Merckle KG: *See*—
Metz, Gunter; and Specker, Manfred, 3,985,790.
Lueders, Willi H., to General Motors Corporation. Tube feeder with self-adjusting loader. 3,985,221, Cl. 198-474.000.
Luisi, James A.: *See*—
Padgett, Clarence W.; Luisi, James A.; and Street, Dana C., 3,986,042.
Lummus Company, The: *See*—
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Lummus Industries, Inc.: *See—*
Van Doorn, Donald W.; Williams, Roy T.; and Hawkins, James B., 3,985,072.

Lumsden, Angus. Calligraphic device for artists or the like. 3,985,456, Cl. 401-145.000.

Lundquist, Ray Arnold. Adjustable routing template. 3,985,168, Cl. 144-144.5GT.

Lundsager, Christian Bent; and Murch, Robert Matthews, to W. R. Grace & Co. Ceramic firing process. 3,985,846, Cl. 264-44.000.

Lurie, Charles L. Pivoted jaw pipe wrench of the three-arm lever type. 3,985,050, Cl. 81-91.00R.

Lussier, Roger Jean; and Magee, John Storey, Jr., to W. R. Grace & Co. Cracking with zeolite catalysts promoted with uranium or uranium plus silver. 3,985,640, Cl. 208-120.000.

Lutz, Hans: *See—*
Adam, Helmut; Lutz, Hans; and Siegle, Gert, 3,985,635.

Lutz, Robert Clare, to Advanced Micro Devices, Inc. High speed logic level converter. 3,986,045, Cl. 307-207.000.

Lyman, Joseph, to Cambridge Thermionic Corporation. Spinning mold method for making permanent magnets. 3,985,588, Cl. 148-103.000.

Lynch, David E.: *See—*
Jahnke, Robert H.; and Lynch, David E., 3,985,189.

Maasberg, Wolfgang; and Scheiding, Horst. Device for cleaning ship's sides, tank walls, and similar surfaces. 3,984,944, Cl. 51-9.00M.

Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, to Mabuchi Motor Co. Ltd. Electric motor mounting fixture. 3,985,322, Cl. 248-5.000.

Mabuchi Motor Co. Ltd.: *See—*
Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, 3,985,322.

MacDougall, Hugh R.: *See—*
Hart, Edward J.; Leeman, James E.; MacDougall, Hugh R.; Marron, John J.; and Smith, Calvin C., 3,985,078.

Machacek, Oldrich, to Atlas Powder Company. Water gel explosives. 3,985,593, Cl. 149-62.000.

Machmer, Wilhelm: *See—*
Politzer, Anton; Sackenreuter, Hans; and Machmer, Wilhelm, 3,985,059.

MacIntyre, Robert W., to Raymond Lee Organization, Inc., The, a part interest. Choke position indicating device. 3,986,165, Cl. 340-52.00D.

MacKellar, John A., to Sea-Scan, Inc. Underwater directional guidance apparatus. 3,986,161, Cl. 340-6.00R.

MacTurk, William L., to General Dynamics Corporation. Method of forming a feed horn. 3,985,851, Cl. 264-104.000.

Maddux, John F., to Owens-Corning Fiberglas Corporation. Apparatus and method for increasing electric power over a range of power in an electric glass melting furnace. 3,985,944, Cl. 13-6.000.

Mader, Helmut: *See—*
Hupp, Gerhard; and Mader, Helmut, 3,985,062.

Madigan, Basil M., to Goodyear Aerospace Corporation. Simplified wheel speed transducer. 3,986,118, Cl. 324-174.000.

Madland, Paul Dale; and Webb, M. Clair, to Motorola, Inc. Clocked IGFET voltage level sustaining circuit. 3,986,044, Cl. 307-205.000.

Magee, John Storey, Jr.: *See—*
Lussier, Roger Jean; and Magee, John Storey, Jr., 3,985,640.

Magerlein, Barney J., to Upjohn Company, The. 4,5-Cis-didehydro-PGA_1 analogs. 3,985,787, Cl. 260-468.00D.

Magill, Robert J.: *See—*
Tamir, Menachem; Martin, Manuel I.; and Magill, Robert J., 3,985,165.

Magnetfabrik Bonn GmbH vorm. Gewerkschaft Windhorst: *See—*
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Steingroever, Erich, 3,985,843.

Mahn, Gustav: *See—*
Rheinlander, Paul; Mahn, Gustav; Berner, Klaus; Schulz, Klaus, deceased; and Ruhland, Ingrid, legal representative, 3,985,549.

Mahoney, John J.: *See—*
Dominey, Sam C.; and Mahoney, John J., 3,985,318.

Maki, Isao, to Takiron Co., Ltd. Detachably interlinked reinforced tubular golf club protectors. 3,985,229, Cl. 206-315.00R.

Makovec, Francesco; Senin, Paolo; and Rovati, Luigi, to Rotta Research Laboratorium S.p.A. Anti-inflammatory and antirheumatic compounds and preparation. 3,985,878, Cl. 424-250.000.

Malgarini, Gianvilvio: *See—*
Iacotti, Italo; Malgarini, Gianvilvio; and Pasero, Edoardo, 3,985,547.

Maltz, Georg, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Connection between coaxial conductor pairs. 3,985,950, Cl. 174-88.00C.

Mandelik, Bernard G.; and Cronkright, Walter A., to Pullman Incorporated. Method for oxidation of SO_2 scrubber sludge. 3,985,860, Cl. 423-242.000.

Maness, Dale D.: *See—*
Cull, Neville L.; Pine, Lloyd A.; and Maness, Dale D., 3,985,682.

Manganaro, James L., to FMC Corporation. Production of granular sodium dichloroisocyanurate. 3,985,744, Cl. 260-248.00C.

Mann, Henry: *See—*
Colton, John Robert; Heick, Robert Bruce; and Mann, Henry, 3,985,967.

Manner, James A., to PPG Industries, Inc. Polymerization of ethylenically unsaturated monomer employing a catalyst system comprising dialkylpyrocarbonate, organic acid anhydride, alkaline reagent and H_2O_2. 3,985,720, Cl. 526-220.000.

Manning, Donald L.; and Scheiter, Milton H., to General Motors Corporation. Power transfer unit. 3,985,035, Cl. 74-15.630.

Manske, Hans E., to Zenith Radio Corporation. Automatic degaussing in television receiver with voltage regulating transformer. 3,986,075, Cl. 315-8.000.

Mantovani, Marisa: *See—*
Butti, Adriano; Prino, Giuseppe; and Mantovani, Marisa, 3,985,871.

Marchese, Vincent P.: *See—*
Corrado, Anthony P.; Timte, Frank; Rakowsky, Edward L.; Marchese, Vincent P.; and Bing, Charles W., 3,985,058.

Maremont Corporation: *See—*
Conley, James F., 3,985,060.

Margraf, Dallas A.: *See—*
Treiber, Fritz F.; and Margraf, Dallas A., 3,985,605.

Mariani, Luigi: *See—*
Fontanella, Luigi; and Mariani, Luigi, 3,985,811.

Marino, Salvatore M., to Fedders Corporation. Cutting mechanism. 3,985,054, Cl. 83-303.000.

Marion Power Shovel Company, Inc.: *See—*
Baron, George B., 3,985,406.

Mariotta, Claudio S.: *See—*
Parkhideh, Mehr Ali; and Mariotta, Claudio S., 3,986,146.

Markin, Mikhail Ivanovich: *See—*
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Marron, John J.: *See—*
Hart, Edward J.; Leeman, James E.; MacDougall, Hugh R.; Marron, John J.; and Smith, Calvin C., 3,985,078.

Marschall, Dieter: *See—*
Oosterkamp, Wijbe Johannes; and Marschall, Dieter, 3,986,064.

Marsee, Frederick J., to Ethyl Corporation. High velocity carburetor. 3,985,838, Cl. 261-44.00R.

Marshall, Harry A.: *See—*
Kalina, Theodore; and Marshall, Harry A., 3,985,519.

Martin, Albert Edward, to Dresser Industries, Inc. Articulated link coupler. 3,985,236, Cl. 213-75.00R.

Martin, Manuel I.: *See—*
Tamir, Menachem; Martin, Manuel I.; and Magill, Robert J., 3,985,165.

Martin, Ronald L., to United States of America, Energy Research and Development Administration. Apparatus for proton radiography. 3,986,026, Cl. 250-306.000.

Martino, Eugene J.; and Walker, Irvin W., to Carmet Company. Wet drilling system. 3,985,367, Cl. 279-20.000.

Maruyama, Motohiro; and Yamamoto, Keiko, to Sankyo Company Limited. Stopping agents for enzyme reactions of dehydrogenase systems. 3,985,621, Cl. 195-103.50R.

Marvin Glass & Associates: *See—*
Meyer, Burton C., 3,985,360.

Masi, James Vincent, to Bunker Ramo Corporation. Liquid crystal cell and method for its manufacture. 3,985,427, Cl. 350-160.0LC.

Maslakovets, Jury Petrovich, deceased: *See—*
Vodakov, Jury Alexandrovich; Lomakina, Galina Alexandrovna; Mokhov, Evgeny Nikolaevich; Kruglov, Igor Ivanovich; Ryzhikov, Igor Veniaminovich; Pavlichenko, Vadim Ivanovich; Kmita, Tatyana Georgievna; Kholuyanov, Georgy Fedorovich; Violin, Eduard Efimovich; Maslakovets, Jury Petrovich, deceased; and Valter-Maslakovets, Irina Vladimirovna, administratrix, 3,986,193.

Maso-Therm Corporation: *See—*
Piazza, Matthew R., 3,984,957.

Mason, Donald R., to Harris Corporation. Process for forming heteroepitaxial structure. 3,985,590, Cl. 148-175.000.

Mason, Marvin S.: *See—*
Field, Robert G.; and Mason, Marvin S., 3,985,965.

Massey, Warren N.: *See—*
Woolman, Raymond D.; and Massey, Warren N., 3,985,321.

Massie, Stephen N., to UOP Inc. Hydroxylation of aromatic compounds. 3,985,796, Cl. 260-502.40R.

Massie, Stephen N., to UOP Inc. Hydroxylation of aromatic compounds. 3,985,797, Cl. 260-502.40R.

Massie, Stephen N.: *See—*
Vesley, Jerome A.; and Massie, Stephen N., 3,985,769.

Masson, Yves, to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Vehicle tire. 3,985,173, Cl. 152-361.0FP.

Masuda, Himeo B.: *See—*
Fry, Stephen M.; and Masuda, Himeo B., 3,986,117.

Masuda, Senichi. Electric dust collector apparatus. 3,985,524, Cl. 55-112.000.

Masumoto, Katashi; and Koguchi, Nobuyuki, to National Research Institute for Metals. Magnetic semiconductor device. 3,986,194, Cl. 357-18.000.

Mata, Justo M.: *See—*
Stapley, Edward O.; and Mata, Justo M., 3,985,742.

Mathewson Corporation: *See—*
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Mathisen, Einar S.: *See—*
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Matjushenko, Raisa Stepanovna: *See—*
Silaev, Alexandr Fedorovich; Matjushenko, Raisa Stepanovna; Popova, Larisa Nikolaevna; Kurganov, Vasily Alexandrovich; Markin, Mikhail Ivanovich; Kurakin, Viktor Ivanovich; Fatjuk, Nina Maximovna; and Nazarova, Anna Kapitonovna, 3,985,513.

Matsudaira, Tadashi; Watanabe, Tadashi; Haruta, Yashuhiko; and Takagi, Teiitsu, to Kansai Paint Company, Ltd. Method for improving emulsion paint by adding an acrylic resin produced from a tertiary amine containing ethylenically unsaturated monomer. 3,985,698, Cl. 260-29.6TA.

Matsumoto, Kazuya; and Yano, Akio, to Canon Kabushiki Kaisha. Method of making a synthetic focused image hologram. 3,985,419, Cl. 350-3.500.

Matsumoto, Kazuya: *See—*
Takashima, Matsuo; Ohtsuka, Minoru; and Matsumoto, Kazuya, 3,985,444.

Matsumoto, Ryohei; Suganuma, Kazuhide; and Takahashi, Satoru. Fuel separating system for starting an internal combustion engine. 3,985,108, Cl. 123-3.000.

Matsumoto, Toshinori: *See—*
Akiyama, Yoshinori; Matsumoto, Toshinori; and Sobajima, Katsunobu, 3,985,193.

Matsumura, Hisashi; Samejima, Tadanori; Orito, Hiroshi; and Ochiai, Hisashi, to Honshu Paper Company, Ltd. Multilayer fibrous structures. 3,984,898, Cl. 19-156.300.

Matsushita Electric Industrial Co., Ltd.: *See—*
Fukai, Masakazu; Fujiwara, Shinji; Serizawa, Hiroyuki; Eguchi, Osamaru; and Kuramoto, Yukimasa, 3,985,918.
Ohkubo, Tsuneo; and Horiike, Yoshio, 3,985,964.
Sato, Kohei, 3,986,080.
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Riffee, Lyle G.; and Horst, William R., 3,985,293.

Neal, John W., to United States of America, Air Force. Isothermal gas dynamic laser nozzle. 3,986,138, Cl. 331-94.50P.

Need, Omar U., III: *See—*
Gipstein, Edward; Moreau, Wayne M.; and Need, Omar U., III, 3,985,915.

Nekoosa Edwards Paper Company, Inc.: *See—*
Norris, Terry O.; Aubey, Rolland A.; and Haug, John E., 3,985,927.

Nelson, Thomas L., to Southern Oxygen Supply Company. Spray machine. 3,985,161, Cl. 239-185.000.

Neuworth, Martin B.: *See—*
Del Bel, Elsio; Jones, Donald C.; and Neuworth, Martin B., 3,985,812.

Newcomb, Fred N.; and Giordano, Dominick J., to United States of America, Army. Weapon sight. 3,984,916, Cl. 33-251.000.

Newman, Jack R., to Swift and Company Limited. Method of treating wastewater with flowable flocculants. 3,985,651, Cl. 210-54.000.

Newman, James W., to Windings, Inc. Package of flexible material for twistless payout with wide funnel guide. 3,985,315, Cl. 242-163.000.

Newman, Neil F., to Exxon Research and Engineering Company. Method of covulcanizing chlorinated low unsaturation rubbers with high unsaturation rubber. 3,985,832, Cl. 260-888.000.

Neyret, Guy, to Societe Anonyme dite: Etablissements Genoud & Cie. Cigarette lighter with automatic gas shutoff. 3,985,493, Cl. 431-150.000.

Nicaise, Jean-Claude Rene; and Cabut, Louis Antoine, to Produits Chimiques Ugine Kuhlmann. Process for the preparation of copper phthalocyanine. 3,985,767, Cl. 260-314.500.

Nichols, George Frederick: *See—*
Vossen, John Louis, Jr.; Nyman, Frederick Russell; and Nichols, George Frederick, 3,984,907.

Nichols, Larry D., to Moleculon Research Corporation. Controlled release materials and method of use. 3,985,298, Cl. 239-54.000.

Nicks, Peter Francis; Osborn, Peter George; Thompson, Morice William; and James, Patricia Lesley, to Imperial Chemical Industries Limited. Process for the production of a dispersion of condensation polymer particles containing a modifying agent. 3,985,700, Cl. 260-33.60R.

Niehaus, William Charles: *See—*
DiLorenzo, James Vincent; Niehaus, William Charles; and Varnerin, Lawrence John, Jr., 3,986,192.

Niemand Bros. Inc.: *See—*
Harris, Robert L., 3,985,951.

Nightingale, Douglas Daniel John, to Imperial Chemical Industries Limited. Plug valves. 3,985,155, Cl. 137-625.480.

Nihon Kogen Concrete Kabushiki Kaisha: *See—*
Suzuki, Shigeru, 3,985,482.

Nikolaev, Mikhail Georgievich: *See—*
Baum, Sergei Alexeevich; Meshkov, Nikolai Mikhailovich; Nikolaev, Mikhail Georgievich; Osipov, Evgeny Yakovlevich; Khaikin, Boris Alexandrovich; and Dymov, Gershon Davidovich, 3,985,225.

Nippon Electric Company, Ltd.: *See—*
Kanazawa, Seiichiro; and Yano, Takeshi, 3,986,151.
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Nishizawa, Jun-ichi; and Mochida, Yasunori, 3,986,060.
Yokoyama, Kenji, 3,986,134.

Nippon Soken, Inc.: *See—*
Kawai, Hisasi; and Katsuoka, Ritsu, 3,986,006.
Wakamatsu, Hisato; Kamiya, Toshihiro; Yoshimi, Tomohisa; and Arai, Hiroshi, 3,986,093.

Nippondenso Co., Ltd.: *See—*
Itoh, Akira, 3,986,005.

Nishimura, Yasutake: *See—*
Yoshimura, Hisashi; and Nishimura, Yasutake, 3,984,885.

Nishizawa, Jun-ichi; and Mochida, Yasunori, to Nippon Gakki Seizo Kabushiki Kaisha. Compound transistor circuitry. 3,986,060, Cl. 307-304.000.

Nissan Motor Co., Ltd.: *See—*
Akiyama, Yoshinori; Matsumoto, Toshinori; and Sobajima, Katsunobu, 3,985,193.
Iizuka, Haruhiko; and Takeuchi, Yasuhisa, 3,985,400.
Nagai, Tadashi, 3,984,976.
Ueno, Zene; and Nagaoka, Tadahiko, 3,985,107.

Nitzsche, Merlin J. Rider propelled rotatable riding device. 3,985,352, Cl. 272-33.00R.

Nix, Hans F.; and Steingroever, Erich, to Elektro-Physik, Hans Nix & Dr. -Ing. E. Steingroever KG. Dual purpose electromagnetic thickness gauge. 3,986,105, Cl. 324-34.0TK.

NL Industries, Inc.: *See—*
Swenson, Carl Richard; Naughton, Frank C.; and Franco, Armando, 3,985,568.

Noble, Mary Lynne, administratrix: *See—*
Noble, Terry Gordon, deceased; and Noble, Mary Lynne, administratrix, 3,984,915.

Noble, Terry Gordon, deceased; and by Noble, Mary Lynne, administratrix. Orthodontics by magnetics. 3,984,915, Cl. 32-14.00R.

Noblitt, Harvey Leander, to Canadian Patents and Development Limited. Scheelite flotation. 3,985,645, Cl. 209-10.000.

Noguchi, Takeshi: *See—*
Hirai, Akiyoshi; Ishikawa, Masakazu; Ito, Sadayoshi; and Noguchi, Takeshi, 3,986,164.

Nomura, Susumu: *See—*
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Nonnenmacher, Gerhard; and Steinmann, Roland, to Robert Bosch G.m.b.H. Radial piston machine. 3,985,065, Cl. 91-498.000.

Nonomura, Kinzo: *See—*
Watanabe, Masanori; and Nonomura, Kinzo, 3,986,074.

Norden, Alexander R., to General Switch Corporation. Panel for plug-in circuit breakers. 3,986,081, Cl. 317-119.000.

Noren, Tore H. Arcuate-shaped modulars for a commercial dishwashing machine. 3,985,226, Cl. 198-738.000.

Norman, Melvin H.: *See—*
Gripe, William B.; and Norman, Melvin H., 3,985,337.

Normark, Olov Magnus. Friction joint between mechanical elements. 3,985,379, Cl. 285-340.000.

Norris, Terry O.; Aubey, Rolland A.; and Haug, John E., to Nekoosa Edwards Paper Company, Inc. Compositions and method for producing a chemical watermark on finished paper products. 3,985,927, Cl. 428-211.000.

North Electric Company: *See—*
Hunter, Patrick L., 3,986,052.

Northe, Melvin M., to Esco Corporation. Chain-type choker hook. 3,984,899, Cl. 24-230.5LH.

Norton Company: *See—*
Scott, John J., 3,985,842.

Norton, Richard V., to Sun Ventures, Inc. Preparation of alkylcarboxamides. 3,985,805, Cl. 260-558.00R.

Notomi, Ryohta; Shigeyoshi, Tuyoshi; and Sugiyama, Masayoshi, to Kohjin Co., Ltd. Preparation of biaxially oriented polyvinyl alcohol film. 3,985,849, Cl. 264-95.000.

NSM Apparatebau GmbH Kommanditgesellschaft: *See—*
Kortenhaus, Dieter; and Busch, Jurgen P., 3,985,217.

Nukem G.m.b.H.: *See—*
Huschka, Hans; Rachor, Lothar; Hrovat, Milan; and Wolff, Willi, 3,985,844.

Numata, Satoshi; Takase, Tsutomu; Morimoto, Yoshio; and Itakura, Toshio, to Mitsui Toatsu Chemicals, Incorporated. Method for the preparation of unsaturated dimers of α-methylstyrenes. 3,985,818, Cl. 260-669.00P.

Nunemaker, John J. Combination candle lighter and extinguisher. 3,985,492, Cl. 431-144.000.

Nurse, Charles Alexander, to General Motors Corporation. Gear shift indicator. 3,985,095, Cl. 116-124.00M.

Nutz, Karl-Dieter, to Licentia Patent-Verwaltungs-G.m.b.H. Sawtooth generator having a wide frequency variation range. 3,986,143, Cl. 331-111.000.

Nyman, Frederick Russell: *See—*
Vossen, John Louis, Jr.; Nyman, Frederick Russell; and Nichols, George Frederick, 3,984,907.

Oakes, Francis W., Jr. Solar heat collector. 3,985,119, Cl. 126-271.000.

Oakite Products, Inc.: *See—*
Chan, Francis Chee Keung; and Heinzelman, Edward, Jr., 3,985,584.

Obara, Hiroshi: *See—*
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Oberlinner, Andreas: *See—*
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Obertegger, Franz: *See—*
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O'Brien, Owen T.: *See—*
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Ochiai, Hisashi: *See—*
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Oda, Noriyuki; Yoshida, Takashi; Nakanishi, Takeshi; Yoshikawa, Kensuke; Adachi, Akira; Ueda, Jitsuhiko; and Mizota, Toshihiro, to Hitachi Shipbuilding and Engineering Co., Ltd. Method of producing high-pressure hydrogen containing gas for use as a power source. 3,985,866, Cl. 423-657.000.

Oder, Robin R., to J. M. Huber Corporation. Method for magnetic beneficiation of particle dispersions. 3,985,646, Cl. 209-214.000.

Oehrli, Urs, to Zellweger Uster Ltd. Method for remote control through a power supply system and apparatus for carrying out the same. 3,986,121, Cl. 325-37.000.

Oelhschlagel, Dietrich: *See—*
Yamaji, Kenkichi; Oelhschlagel, Dietrich; and Abe, Hajime, 3,985,280.

Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): *See—*
Bibring, Herve; Trottier, Jean-Pierre; Khan, Tasadduq; Stohr, Jean-Francois; and Rabinovitch, Maurice, 3,985,582.

Oganesian, Oganes Vardanovich: *See—*
Volkov, Mstislav Vasilievich; and Oganesian, Oganes Vardanovich, 3,985,127.

Ogawa, Masaya: *See—*
Tanaka, Susumu; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 3,985,436.

Oger, Jacques Francois; and Hauer, Jean Claude Victor, to Pont-A-Mousson S.A. Casing voussoir. 3,984,956, Cl. 52-249.000.

Ogura, Jiro: *See—*
Takahashi, Masaaki; Ito, Akira; Igarashi, Yuriko; Kawada, Shichiro; Ogura, Jiro; and Ito, Ryoichi, 3,985,938.

Ohi Mfg. Co., Ltd.: *See—*
Kobayashi, Fumio, 3,985,381.

Ohio State University Research Foundation, The: *See—*
Gassman, Paul G.; and Gruetzmacher, Gordon D., 3,985,756.

Ohkubo, Hiroyuki: *See—*
Kono, Yasumasa; Miyahara, Shuji; Nomura, Susumu; Ohkubo, Hiroyuki; Fujimori, Yoshio; Iwawaki, Akira; and Hirata, Hiromasa, 3,984,943.

Ohkubo, Tsuneo; and Horiike, Yoshio, to Matsushita Electric Industrial Co., Ltd. 4-Channel stereophonic demodulating system. 3,985,964, Cl. 179-15.0BT.

Ohta, Hiroshi: *See—*
Kojima, Chiaki; Ohta, Hiroshi; and Aoki, Hidekazu, 3,985,390.

Ohta, Mitsuo, to Tokyo Keiki Co., Ltd. Output control device for a hydraulic pump of the variable displacement type. 3,985,469, Cl. 417-222.000.

Ohtsuka, Minoru: *See—*
Takashima, Matsuo; Ohtsuka, Minoru; and Matsumoto, Kazuya, 3,985,444.

Ohya, Masaki: *See—*
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Okabe, Hiromichi: *See—*
Kobayashi, Katsumi; Dohgane, Iwao; Okabe, Hiromichi; and Tanimoto, Kenji, 3,985,819.

Okada, Ryuzo: *See—*
Nagashima, Toshio; Nakaguchi, Mitsuharu; Tsukamoto, Takuzo; Okada, Ryuzo; Kito, Hidetoshi; and Handa, Kenichi, 3,985,099.

Okada, Takashi; and Utsunomiya, Kimitake, to Sony Corporation. Non-linear amplifier. 3,986,048, Cl. 307-229.000.

Okada, Takashi; and Utsunomiya, Kimitake, to Sony Corporation. Signal switching apparatus. 3,986,051, Cl. 307-254.000.

Okano, Hiroshi; and Morishita, Teru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Gas bearing assembly. 3,985,405, Cl. 308-9.000.

Oke, Stanley A. E.; and Thies, Jerome A., to Caterpillar Tractor Co. Corner reinforcement for various sized loader buckets. 3,984,928, Cl. 37-141.00R.

Oki Electric Industry Company, Ltd.: *See—*
Komine, Shigeharu; Tanaka, Yoshiaki; and Kuzuya, Shiro, 3,985,959.

Okuda, Yoshihiko: *See—*
Nakano, Takeshi; Kurata, Kunisige; Okuda, Yoshihiko; and Araki, Tsunehiko, 3,985,453.

Okumura, Jun: *See—*
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O'Leary, William, to Artiloc U.S.A. Inc. Protective cover for an anti-jack knife device. 3,985,369, Cl. 280-432.000.

Olin Corporation: *See—*
Shapiro, Stanley; and Lanam, Richard D., 3,985,589.

Oliver, Robert; Waterman, William John; and Wilson, Hamish Dundas, to Vandervell Products Limited. Bearings for railway vehicles. 3,985,407, Cl. 308-237.00R.

Olschewski, Armin: *See—*
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 3,985,215.

Olsson, Curt Sigvard, to SIKOB Svensk Industris Konstrucktions och Berakningskontor AB. Hand-cart with collapsible wheels. 3,985,372, Cl. 280-652.000.

Olszewski, Jerzy A.; and Jachimowicz, Ludwik, to General Cable Corporation. Watertight disc coaxial cables. 3,985,948, Cl. 174-28.000.

Olympia Werke KG: *See—*
Rix, Albert; and Drogi, Dieter, 3,985,220.

Omnium de Prospective Industrielle: *See—*
Lefebvre, Michel S. M.; and Davidovits, Joseph, 3,985,925.

Omori, Masahiro: *See—*
Decker, David Richard; and Omori, Masahiro, 3,986,196.

Omori, Shigenori: *See—*
Terada, Fumio; Omori, Shigenori; Takahashi, Kihei; and Ida, Hiroshi, 3,984,970.

Onder, Besir K.: *See—*
Farrissey, William J., Jr.; and Onder, Besir K., 3,985,934.

O'Neal, Cleveland, Jr., to Sherwin-Williams Company, The. Process for inhibiting metal corrosion. 3,985,503, Cl. 21-2.70R.

Onoda Cement Company, Ltd.: *See—*
Itoh, Tsutomu, 3,985,297.

Oosterkamp, Wijbe Johannes; and Marschall, Dieter, to U.S. Philips Corporation. Rotary-anode X-ray tube. 3,986,064, Cl. 313-60.000.

Oppenlaender, Knut: *See—*
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Opresko, Stephen Thomas: *See—*
Pinch, Harry Louis; and Opresko, Stephen Thomas, 3,985,919.
Orito, Hiroshi: *See—*
Matsumura, Hisashi; Samejima, Tadanori; Orito, Hiroshi; and Ochiai, Hisashi, 3,984,898.
Orke, Gustav Georg: *See—*
Imberg, Bengt Uno; Karlsson, Kurt Hakan; and Orke, Gustav Georg, 3,985,993.
Ormond, Alfred Newman. Shear measuring flexure isolated load cells. 3,985,025, Cl. 73-141.00A.
Osborn, Peter George: *See—*
Nicks, Peter Francis; Osborn, Peter George; Thompson, Morice William; and James, Patricia Lesley, 3,985,700.
Oscar Mayer & Co. Inc.: *See—*
Balch, James L.; Anderson, James E.; and Sadeski, Boleslaus J., 3,985,052.
Oseto, Moichi, to Amada Company Limited. Multiple tool holding punching unit. 3,985,056, Cl. 83-552.000.
Osipov, Evgeny Yakovlevich: *See—*
Baum, Sergei Alexeevich; Meshkov, Nikolai Mikhailovich; Nikolaev, Mikhail Georgievich; Osipov, Evgeny Yakovlevich; Khaikin, Boris Alexandrovich; and Dymov, Gershon Davidovich, 3,985,225.
Oswald, Bernard J.: *See—*
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Oszlanyi, Antal G.: *See—*
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Ott, Howard: *See—*
Larson, Kay R.; Drew, John; and Ott, Howard, 3,985,634.
Outboard Marine Corporation: *See—*
Du Bois, Chester G.; and Pollari, Howard M., 3,985,113.
Outtier, Raymond M. C., to International Harvester Company. Harvesting machine equipped with a stalk cutter. 3,984,966, Cl. 56-10.200.
Overall, Wilson W.; and Waldman, Jerry R., to Surface Systems, Inc. Water depth measuring device. 3,986,110, Cl. 324-61.00R.
Overly Manufacturing Company: *See—*
Murray, Wakefield, 3,984,958.
Owens-Corning Fiberglas Corporation: *See—*
Clay, Frank M.; Moran, Leland G.; and Lawyer, Russell R., 3,985,483.
Garst, John M., 3,985,712.
Maddux, John F., 3,985,944.
Owens-Illinois, Inc.: *See—*
Blackwelder, Maurice W., 3,985,931.
Gray, Don N., 3,985,715.
Griffin, Lawrence C.; Peters, Homer D. F.; and Smith, Douglas E., 3,985,026.
Oxy Metal Industries Corporation: *See—*
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Clauss, Richard John; Tremmel, Robert Arnold; and Becking, Donald Harvey, 3,985,784.
Ozark-Mahoning Company: *See—*
Connally, Carl A., 3,985,609.
Ozolins, Jekabs: *See—*
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P. Bjorshol Mek. Verksted: *See—*
Bjorshol, Oyvind Ottar, 3,985,339.
Padgett, Clarence W.; Luisi, James A.; and Street, Dana C., to Rockwell International Corporation. CMOS Boolean logic mechanization. 3,986,042, Cl. 307-205.000.
Page Communications Engineers, Inc.: *See—*
Mitchell, Joseph H., Jr., 3,986,124.
Pagen, Charles A.: *See—*
Petrucco, Richard J.; and Pagen, Charles A., 3,985,694.
Pall Corporation: *See—*
Cooper, Roydon B., 3,985,652.
Pall, David Boris, 3,985,654.
Pall, David Boris, to Pall Corporation. Filter assembly for fluid polymeric material. 3,985,654, Cl. 210-232.000.
Palmans, Willy Joseph: *See—*
Van Biesen, Jozef Antoon; and Palmans, Willy Joseph, 3,986,189.
Palsson, Jan F., to AB Ziristor. Material in the form of a web or of sheets for the manufacture of packing containers or parts thereof. 3,985,284, Cl. 229-3.50R.
Panagrossi, Ahmed, to Quantum, Inc. Method for producing a balloon type catheter having a smooth continuous outer surface. 3,985,601, Cl. 156-229.000.
Panetta, Charles A.; and Casanova, Travis G., to University of Mississippi, The. Trifluoroacetylation process. 3,985,723, Cl. 260-112.50R.
Pankove, Jacques Isaac, to RCA Corporation. Insulating nitride compounds as electron emitters. 3,986,065, Cl. 313-94.000.
Papst-Motoren KG: *See—*
Muller, Rolf, 3,986,086.
Paragamian, Vasken; and Taylor, Russell J., Jr., to McNeil Laboratories, Incorporated. 2-(R'-oxymethyl)-perimidines. 3,985,880, Cl. 424-251.000.
Parent, Richard A.: *See—*
Lu, Chin H.; and Parent, Richard A., 3,985,663.
Parker, Alexander Lovell, to Accurate Machine and Engineering Co. Drive chuck. 3,985,312, Cl. 242-72.00R.
Parkhideh, Mehr Ali; and Mariotta, Claudio S., to Farinon Electric. Double balanced modulator-demodulator. 3,986,146, Cl. 332-16.00T.
Paroty, Jean-Marie, to Interlight. Writing implement having a replaceable refill. 3,985,457, Cl. 401-209.000.
Pasero, Edoardo: *See—*
Iacotti, Italo; Malgarini, Giansilvio; and Pasero, Edoardo, 3,985,547.
Pataky, Gilbert A.: *See—*
Hall, John L.; and Pataky, Gilbert A., 3,985,214.
Patel, Amrut R., to Allis-Chalmers Corporation. Means for recycling liquified insulating gas in a gas insulated circuit breaker. 3,985,987, Cl. 200-148.00E.
Patrin, Nicholas Alex, to International Business Machines Corporation. Semiconductor color detector. 3,985,449, Cl. 356-173.000.
Patry, Francis Joseph, to Johns-Manville Corporation. Roof structure including a one-way vapor vent. 3,984,947, Cl. 52-1.000.
Paul, John C., to Hoffman Information Identification Inc. Communication apparatus for communicating between a first and a second object. 3,986,167, Cl. 340-146.1BA.
Paull, Peter L.: *See—*
Suggitt, Robert M.; and Paull, Peter L., 3,985,639.
Paulsen, Gary Allen, to Spraying Systems Co. Solenoid valve. 3,985,333, Cl. 251-129.000.
Pavlichenko, Vadim Ivanovich: *See—*
Vodakov, Jury Alexandrovich; Lomakina, Galina Alexandrovna; Mokhov, Evgeny Nikolaevich; Kruglov, Igor Ivanovich; Ryzhikov, Igor Veniaminovich; Pavlichenko, Vadim Ivanovich; Kmita, Tatyana Georgievna; Kholuyanov, Georgy Fedorovich; Violin, Eduard Efimovich; Maslakovets, Jury Petrovich, deceased; and Valter-Maslakovets, Irina Vladimirovna, administratrix, 3,986,193.
Payne, Leslie E. Apparatus for forming cigarette filters. 3,985,144, Cl. 131-92.000.
Penar, Leonard J. Combination balloon catheter and emergency means for deflating the balloon. 3,985,139, Cl. 128-349.00B.
Penicaud, Etienne: *See—*
Durand, Jean-Michel; and Penicaud, Etienne, 3,985,979.
Perche, Philippe: *See—*
Feuillade, Georges; Chenaux, Bernard; and Perche, Philippe, 3,985,574.
Perma Company, The: *See—*
Trenda, Dorn D.; and Anderson, Donald R., 3,985,598.
Peter Piper Plastics, Inc.: *See—*
Piper, Peter D.; and Bouldin, Kent W., 3,985,460.
Petermann, James P.; Helversen, Frederick D.; and Thomas, Jack A., to Georgia-Pacific Corporation. Automatic spray cleaning apparatus and method. 3,985,572, Cl. 134-34.000.
Peters, Homer D. F.: *See—*
Griffin, Lawrence C.; Peters, Homer D. F.; and Smith, Douglas E., 3,985,026.
Peters, Josef: *See—*
Gebhardt, Gunter; and Peters, Josef, 3,985,627.
Peters, Martinus T. J., to Oce-van der Grinten N.V. Toner powder for electrostatic images. 3,985,559, Cl. 96-1.0SD.
Petersen, Harry, Jr. Chamber ice fishing pole. 3,984,935, Cl. 43-17.000.
Petersson, Stig Arvid, to Boliden Aktiebolag. Method for the production of liquid sulphur dioxide. 3,985,529, Cl. 62-17.000.
Petit, Andre, to Solvay & Cie. Process for terminating the polymerization of vinyl chloride in aqueous dispersion. 3,985,721, Cl. 526-84.000.
Petit, Georges, to Alfio Maccarone. Elevator bridge with columns. 3,985,207, Cl. 187-8.500.
Petitpierre, Jean-Claude, to Ciba-Geigy Corporation. Pressure-sensitive and/or heat sensitive copying or recording material. 3,985,936, Cl. 428-411.000.
Petrolite Corporation: *See—*
Friel, John P.; and Hammond, Paul L., 3,985,642.
Petrucco, Richard J.; and Pagen, Charles A., to Mobil Oil Corporation. Asphaltic compositions containing synthetic terpenic resin and an interpolymer of ethylene, vinyl acetate and an organic acid. 3,985,694, Cl. 260-28.5AS.
Petzholdt, J. S.: *See—*
Schmitt, Armin, 3,985,607.
Petzoldt, Fritz J. G. E. Multi-spindle automat. 3,984,905, Cl. 29-38.00R.
Peyser, Leonard F. Bead chain sprocket construction. 3,985,037, Cl. 74-229.000.
Pfansuehl Laboratories, Inc.: *See—*
Holstein, Arthur G., 3,985,870.
Pfister, Hans: *See—*
Diepers, Heinrich; Pfister, Hans; and Jablonski, Karl-Heinz, 3,985,281.
Phillippi, John F., to Aerodyne Development Corporation. Dust collector with spaced volutes. 3,985,526, Cl. 55-261.000.
Phillips Petroleum Company: *See—*
Doss, Richard C., 3,985,673.
Drake, Charles A., 3,985,786.
Finch, Jack N.; and Ripley, Dennis L., 3,985,641.
Hawkins, Harold M., 3,985,622.
Seefluth, Charles L., 3,985,850.
Vautrain, Lucien H.; and Ems, Herbert A., 3,985,864.
Philofsky, Elliott M.: *See—*
Greeson, Richard L.; and Philofsky, Elliott M., 3,985,515.

Piasek, Edmund J.; and Karll, Robert E., to Standard Oil Company (Indiana). Lubricating oils containing high molecular weight Mannich condensation products. 3,985,802, Cl. 260-553.00A.

Piazza, Matthew R., to Maso-Therm Corporation. Composite building module. 3,984,957, Cl. 52-309.000.

Picquendar, Jean-Edgar; and Tung, Pham Ngu, to Thomson-CSF. Semiconductor store element and stores formed by matrices of such elements. 3,986,177, Cl. 340-173.00R.

Pieniak, Heinz Alfred: *See—*
Lepoutre, Pierre; and Pieniak, Heinz Alfred, 3,985,599.

Pierce, Lester V., to Raymond Lee Organization, Inc., The, a part interest. Tiller combination. 3,985,185, Cl. 172-81.000.

Pierson, Robert M.; and Kuzma, Leonard J., to Goodyear Tire & Rubber Company, The. Method of polymerization. 3,985,941, Cl. 526-133.000.

Pigasse, Daniel Francois Xavier: *See—*
Cabut, Louis Antoine; Hardouin, Jean-Claude Henri Raoul; Huille, Michel Ernest Antoine; and Pigasse, Daniel Francois Xavier, 3,985,570.

Pikorz, Wolfgang: *See—*
Herold, Ludwig; Pikorz, Wolfgang; and Sonntag, Alois, 3,986,201.

Pilkington Brothers Limited: *See—*
Hynd, William Christie, 3,985,530.

Pillon, Horst; and Morath, Gunther, to Moeller & Neumann GmbH. Apparatus for rapidly changing straightening rollers of a roller straightening machine. 3,985,013, Cl. 72-238.000.

Pinch, Harry Louis; and Opresko, Stephen Thomas, to RCA Corporation. Vapor deposition of cermet layers. 3,985,919, Cl. 427-101.000.

Pine, Lloyd A.: *See—*
Cull, Neville L.; Pine, Lloyd A.; and Maness, Dale D., 3,985,682.

Pinney, Baden McDowall, to Du Pont of Canada Limited. Self-purging injection valve. 3,985,300, Cl. 239-119.000.

Piper, Peter D.; and Bouldin, Kent W., to Peter Piper Plastics, Inc. Frame seat and mechanism for joining frame portions thereof. 3,985,460, Cl. 403-234.000.

Pitney-Bowes, Inc.: *See—*
Calvi, Salvatore J., 3,985,433.

Pittaro, Richard J.: *See—*
Dileo, Christopher C.; and Pittaro, Richard J., 3,985,022.

Pittsburgh Forgings Company: *See—*
Buzza, Richard S., 3,985,235.

Plaza, Mario G.; and Trezise, Richard D., to Xerox Corporation. Carriage support apparatus. 3,985,404, Cl. 308-5.00R.

Plazanet, Jacques: *See—*
De Taffin, Francois; and Plazanet, Jacques, 3,985,691.

Plempel, Manfred: *See—*
Regel, Erik; Buchel, Karl Heinz; and Plempel, Manfred, 3,985,766.

Plockl, Johann, to Erwin Sick Optik-Elektronik. Method of measuring the pitch angle of yarns provided with a twist. 3,985,451, Cl. 356-199.000.

Plouzek, Eugene Alan, to Caterpillar Tractor Co. Duo-cone seal flexible mounting. 3,985,366, Cl. 277-92.000.

Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See—*
Masson, Yves, 3,985,173.

Poduje, Noel S., to ADE Corporation. Self-calibrating dimension gauge. 3,986,109, Cl. 324-61.00R.

Pofferi, Giancarlo, to Ufficio Tecnico Ing. A. Mannucci. Support structure. 3,985,083, Cl. 108-111.000.

Pohlke, Rolf: *See—*
Mehrhof, Werner; Pohlke, Rolf; Becker, Karl Heinz; and Schliep, Hans-Jochen, 3,985,881.

Politzer, Anton; Sackenreuter, Hans; and Machmer, Wilhelm, to DIEHL. Clamping device for sealing rings on a tiltable cartridge chamber for a weapon. 3,985,059, Cl. 89-25.000.

Pollard, John Francis, to English Electric Valve Company Limited. Waveguide to co-axial line junctions. 3,986,148, Cl. 333-7.00R.

Pollari, Howard M.: *See—*
Du Bois, Chester G.; and Pollari, Howard M., 3,985,113.

Poly-Wide, Inc.: *See—*
Wideman, Ronald H., 3,985,130.

Pomerhn, Robert C.; and Johnson, Robert M., to National Gypsum Company. Water-resistant asbestos-cement. 3,985,610, Cl. 162-133.000.

Pont-A-Mousson S.A.: *See—*
Oger, Jacques Francois; and Hauer, Jean Claude Victor, 3,984,956.

Poole, John S.; Muhlestein, H. Blair; Smith, Douglas H.; and Bilen, Lennart, to Hewlett-Packard Company. Printer-plotter system. 3,986,011, Cl. 235-151.220.

Popova, Larisa Nikolaevna: *See—*
Silaev, Alexandr Fedorovich; Matjushenko, Raisa Stepanovna; Popova, Larisa Nikolaevna; Kurganov, Vasily Alexandrovich; Markin, Mikhail Ivanovich; Kurakin, Viktor Ivanovich; Fatjuk, Nina Maximovna; and Nazarova, Anna Kapitonovna, 3,985,513.

Poretti, Isidoro: *See—*
Monti, Giancarlo; and Poretti, Isidoro, 3,985,956.

Porter, Oswald Mead: *See—*
Herr, John Addison; and Porter, Oswald Mead, 3,985,087.

Porter, Rotheus Byram, to Moore and Munger. Paper coating dispersions and process. 3,985,932, Cl. 428-326.000.

Portier, Jean-Louis, to Soletanche. Obturating device, especially for injection tubes. 3,984,988, Cl. 61-35.000.

Portwood, Owen: *See—*
Grimm, Robert A.; Portwood, Owen; Sedor, Edward A.; and Williams, Jeannene A., 3,985,807.

Post, Lloyd D.; Holley, William J.; Kosonocky, Stephan; and Dineen, John J., to United States of America, Army. Self-destruct fuze for spinning artillery projectile. 3,985,079, Cl. 102-80.000.

Pottier, Michel: *See—*
Senes, Michel; Pottier, Michel; and Courdier, Jean-Francois, 3,985,681.

Pottinger, Eugene A.; and Shelton, Winston L., to Collectramatic, Inc. Basket for use in deep fat cooking of comestibles. 3,985,071, Cl. 99-403.000.

Powaska, Tadeusz. Automobile passenger's individual table. 3,985,374, Cl. 280-730.000.

Powell, George L.; and Holcombe, Cressie E., Jr., to United States of America, Energy Research and Development Administration. Process for removing carbon from uranium. 3,985,551, Cl. 75-84.10R.

Powell, James E., to Shell Oil Company. Pyrimido(4,3-b)(1,3)thiazin-6-ones. 3,985,735, Cl. 260-243.00R.

Powell, James E.; and Roman, Steven A., to Shell Oil Company. N-(sulfur-substituted)-2H-1,3-thiazin-2-ylidene nitromethyl ketones and nitroacetic acid esters. 3,985,736, Cl. 260-243.00R.

PPG Industries, Inc.: *See—*
Manner, James A., 3,985,720.

Prazak, Charles J., III, to Zenith Radio Corporation. Apparatus for coating skirtless cathode ray tube panels. 3,984,902, Cl. 29-25.190.

Precision Parts Corporation: *See—*
Harmon, Paul V., 3,985,202.

Presray Corporation, The: *See—*
Schroth, Raymond A., 3,984,942.

Prevost, Michel; and Vourron, Bernard, to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf. Device for continuous sampling, especially in a distillation column for topping crude petroleum. 3,985,624, Cl. 196-132.000.

Price, Robert T., to General Motors Corporation. Internal combustion engine exhaust emission control. 3,984,975, Cl. 60-274.000.

Prichard, Evan: *See—*
Decker, Raymond E.; and Prichard, Evan, 3,985,036.

Priestap, Horacio Alfredo; and Rappaport, Carlos, to E. R. Squibb & Sons, Inc. Process for producing rolitetracycline. 3,985,768, Cl. 260-326.330.

Prince, Kenneth E., to Eli Lilly and Company. Two-piece container. 3,985,289, Cl. 229-44.00R.

Prino, Giuseppe: *See—*
Butti, Adriano; Prino, Giuseppe; and Mantovani, Marisa, 3,985,871.

Prinz, Peter: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 3,985,800.

Pritz, Howard B.: *See—*
Bennett, Russell B.; Campbell, Clair E.; and Pritz, Howard B., 3,985,535.

Pritza, Mike, to Raymond Lee Organization, Inc., The, a part interest. Artificial Christmas tree. 3,985,924, Cl. 428-9.000.

Procter & Gamble Company, The: *See—*
Barrat, Christian, 3,985,686.
Basadur, Marino S., 3,985,923.
Hartman, William Law, 3,985,668.
Krummel, H. Karl; and Gault, Terrell W., 3,985,669.

Produits Chimiques Ugine Kuhlmann: *See—*
Cabut, Louis Antoine; and Huille, Michel Ernest Antoine, 3,985,569.
Cabut, Louis Antoine; Hardouin, Jean-Claude Henri Raoul; Huille, Michel Ernest Antoine; and Pigasse, Daniel Francois Xavier, 3,985,570.
Nicaise, Jean-Claude Rene; and Cabut, Louis Antoine, 3,985,767.

Progressive Dynamics, Inc.: *See—*
Ferguson, Robert J., 3,985,157.

Protiva, Miroslav; Jilek, Jiri; Sindelar, Karel; and Metysova, Jirina, to SPOFA, Sdruzeni podniku pro zdravotnickou vyrobu. Fatty acid esters of 8-substituted 10-[4-(hydroxyalkyl)piperazino]-10,11-dihydrodibenzo[b,f]thiepins. 3,985,750, Cl. 260-268.0TR.

Protomastro, Michael G.: *See—*
Scelia, Richard P.; Fagan, Kenneth W.; and Protomastro, Michael G., 3,985,905.

Pruessner, Manfred K., to United States of America, Navy. Multi position solid state touch switch. 3,986,003, Cl. 235-92.0EA.

Pryor, Edward G.: *See—*
Loshbough, Richard C.; Williams, Roger B., Jr.; and Pryor, Edward G., 3,986,012.

Pukl, Kenneth J., to Dow Chemical Company, The. Foam plastic injection molding. 3,985,175, Cl. 160-229.00R.

Pullman Incorporated: *See—*
Mandelik, Bernard G.; and Cronkright, Walter A., 3,985,860.

Pulse Engineering Inc.: *See—*
Kent, Bryan; and Kent, Duane, 3,985,310.

Puskas, Imre: *See—*
Cengel, John A.; and Puskas, Imre, 3,985,672.

Pyzel, Ewald D.; and Codding, Harold E., to Ski Safe Inc. Touring ski boot heel binding. 3,985,371, Cl. 280-614.000.

Quaker Oats Company, The: *See—*
Bernotavicz, John W., 3,985,904.

Quantum, Inc.: *See—*
Panagrossi, Ahmed, 3,985,601.

Queen's University: *See—*
Wolfe, Saul, 3,985,764.

Quigley, Patrick C.; and Chamberlin, James C. Knock-down plastic container for produce and the like. 3,985,258, Cl. 220-4.00F.

Quiogue, Virgilio J.; Eldert, Cornelius; and Worst, John L., to Burroughs Corporation. Carrier positioning system. 3,986,091, Cl. 318-594.000.

Quiogue, Virgilio J.; Eldert, Cornelius; and Worst, John L., to Burroughs Corporation. Logic system for print ball tilt control. 3,986,094, Cl. 318-696.000.

Rabinovitch, Maurice: *See—*
Bibring, Herve; Trottier, Jean-Pierre; Khan, Tasadduq; Stohr, Jean-Francois; and Rabinovitch, Maurice, 3,985,582.

Rachor, Lothar: *See—*
Huschka, Hans; Rachor, Lothar; Hrovat, Milan; and Wolff, Willi, 3,985,844.

Radermacher, Leonhard, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Arrangement for electrical detection of ions for mass-spectroscopic determination of the mass-magnitudes and mass-intensities of ions. 3,986,024, Cl. 250-299.000.

Radiochemical Centre Limited, The: *See—*
Redshaw, Martin Ralphs, 3,985,867.

Raggett, Stephen Richard: *See—*
Sword, Geoffrey; Lawrence, John Leslie; Raggett, Stephen Richard; and Blakemore, Bernard, 3,986,089.

Rahilly, William P., to United States of America, Air Force. Rib and channel vertical multijunction solar cell. 3,985,579, Cl. 136-89.000.

Raio, Eugene L.; and Kennedy, Andrew P., to Stearns Product Development Corporation. Utility building system. 3,984,960, Cl. 52-582.000.

Raivio, Roy K., to General Motors Corporation. Overcenter type latch. 3,985,380, Cl. 292-69.000.

Rakowsky, Edward L.: *See—*
Corrado, Anthony P.; Timte, Frank; Rakowsky, Edward L.; Marchese, Vincent P.; and Bing, Charles W., 3,985,058.

Randolph, Byron B., Jr., to Gardiner, Robert F. Dual frequency metal detector system. 3,986,104, Cl. 324-3.000.

Ransburg Electro-Coating Corporation: *See—*
Miller, Emery P., 3,985,100.

Rappaport, Carlos: *See—*
Priestap, Horacio Alfredo; and Rappaport, Carlos, 3,985,768.

Rawson, Edward B.; Krasnick, Bernard; and Schaefer, Theodore, Jr., to Searle Medidata, Inc. System and process for preschool screening of children. 3,984,923, Cl. 35-9.00A.

Ray, David J., to United States of America, Air Force. Integrated feedback active filter/integrator. 3,986,127, Cl. 328-128.000.

Raychem Corporation: *See—*
Evans, Joseph H., 3,985,852.

Raymond, Brian W.; Riva, Donald A.; and Stuchberry, Frederick C., to Shell Oil Company. Tar sands conditioning drum. 3,984,920, Cl. 34-134.000.

Raymond Lee Organization, Inc., The: *See—*
Cowdrick, Arthur, 3,984,938.
De Tola, Vincent D., 3,985,086.
MacIntyre, Robert W., 3,986,165.
Pierce, Lester V., 3,985,185.
Pritza, Mike, 3,985,924.
Weiss, David Y., 3,984,934.
Young, Joseph P.; and Young, Sylvia, 3,985,410.

Raytheon Company: *See—*
Kim, Chung Kyu, 3,986,142.

RCA Corporation: *See—*
Ford, John Randolph, 3,985,033.
Kosonocky, Walter Frank, 3,986,198.
Pankove, Jacques Isaac, 3,986,065.
Pinch, Harry Louis; and Opresko, Stephen Thomas, 3,985,919.
Smith, Bradford Knox, 3,986,156.
Vossen, John Louis, Jr.; Nyman, Frederick Russell; and Nichols, George Frederick, 3,984,907.
Weimer, Paul Kessler, 3,986,176.
Wittlinger, Harold Allen, 3,986,132.

Reardon, Robert C., Jr.: *See—*
Gutierrez, Eddie N.; and Reardon, Robert C., Jr., 3,985,808.

Reas, Arley J. Control System for synchronizing engines. 3,984,986, Cl. 60-702.000.

Recognition Equipment Incorporated: *See—*
McJohnson, Robert B., 3,986,000.

Redman, Howard E., to Mathewson Corporation. Knotting gear. 3,985,162, Cl. 140-36.000.

Redshaw, Charles G. Rotary stirling engine. 3,984,981, Cl. 60-519.000.

Redshaw, Martin Ralphs, to Radiochemical Centre Limited, The. Immunoassays employing a colored second antibody. 3,985,867, Cl. 424-1.500.

Reed, Alfred J., to J. P. Stevens & Co., Inc. Preseamed and preformed knitted garments and method of making same. 3,985,003, Cl. 66-196.000.

Reegen, Sidney L.: *See—*
Frisch, Kurt C.; Reegen, Sidney L.; and Bauer, Harry L., 3,985,713.

Regan Offshore International, Inc.: *See—*
Jones, Howard W., 3,984,990.

Regel, Erik; Buchel, Karl Heinz; and Plempel, Manfred, to Bayer Aktiengesellschaft. Bis-imidazolyl-bisphenylmethane and salts thereof. 3,985,766, Cl. 260-309.000.

Regie Nationale des Usines Renault: *See—*
Gallinato-Contino, Roland, 3,985,403.
Tixier, Michel, 3,985,195.

Reich, Murray; and Hudgin, Donald E. Degradable plastic. 3,984,940, Cl. 47-9.000.

Reid, Walter: *See—*
Jepson, John W.; Reid, Walter; and Brown, Robert A., 3,985,363.

Reihm, Richard S.: *See—*
Farhat, David L.; and Reihm, Richard S., 3,985,231.

Reilly, Joseph R., to Monsanto Company. Method for handling workpieces. 3,985,251, Cl. 214-152.000.

Reinhardt, Helmut; Trebinger, Karl; and Kallrath, Gottfried, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of Berlin blue. 3,985,571, Cl. 106-304.000.

Reinsma, Harold L., to Caterpillar Tractor Co. Cushioned track roller for track-type vehicles. 3,985,402, Cl. 305-27.000.

Reisinger, Konrad: *See—*
Voss, Hans Heinrich; Dieter, Karl Georg; and Reisinger, Konrad, 3,985,961.

Rekers, Louis J.; and Katzen, Stanley J., to National Petro Chemicals Corporation. Catalyst composition and method for the preparation thereof. 3,985,676, Cl. 252-428.000.

Reliance Electric Company: *See—*
Loshbough, Richard C.; Williams, Roger B., Jr.; and Pryor, Edward G., 3,986,012.

Rembaum, Alan; Yen, Shiao-Ping Siao; and Dreyer, William J., to California Institute of Technology. Small, porous polyacrylate beads. 3,985,632, Cl. 204-159.150.

Rendfeld, Fred A.: *See—*
Ahola, Jacob W.; and Rendfeld, Fred A., 3,985,377.

Research Corporation: *See—*
Rohrbach, Roger P.; and Kim, Kun Ha, 3,985,263.

Research Foundation for Microbial Diseases of Osaka University: *See—*
Kubo, Takashi, 3,985,615.

Revell, Alan E., to American Air Filter Company, Inc. Control means and automatic roll-type filter. 3,985,528, Cl. 55-352.000.

Rexnord Inc.: *See—*
Davis, D. Carter; and Sawant, Ulhas S., 3,985,308.
Davis, D. Carter; and Sawant, Ulhas S., 3,985,309.

Reynolds, Richard Paton: *See—*
Hackett, Clarence Bertram; Jack, James; and Reynolds, Richard Paton, 3,985,592.

Rheinlander, Paul; Mahn, Gustav; Berner, Klaus; Schulz, Klaus, deceased; and by Ruhland, Ingrid, legal representative, to Stahlwerke Peine-Salzgitter Aktiengesellschaft. Process for continuously refining molten metals. 3,985,549, Cl. 75-52.000.

Rhone-Poulenc S.A.: *See—*
Chabert, Henri; Chapurlat, Robert; Gigou, Claude; and Ruaud, Michel, 3,985,718.
Giraudon, Raymond, 3,985,782.
Lissot, Jean; and Sausse, Andre, 3,985,134.

Ribka, Joachim; Rieper, Wolfgang; and Zunker, Reinhard, to Hoechst Aktiengesellschaft. Quinolino-azo-aceto-acetylaminobenzimidazolone pigments fast to heat. 3,985,725, Cl. 260-155.000.

Rice, Robert D.; Bossler, Thomas H.; and Hamilton, Charles W., Jr., to United States Steel Corporation. Process for the separation and recovery of ammonia and acid gases. 3,985,863, Cl. 423-352.000.

Rice, Stephen L. Impact wear testing device. 3,985,015, Cl. 73-12.000.

Richardson-Merrell Inc.: *See—*
Carr, Albert A.; and Meyer, Donald R., 3,985,888.

Richardson, Russell William: *See—*
Fenton, Hugh Miles Roxburgh, 3,985,417.

Ricketts, Craig M.; and Ricketts, Robert M. Dental implement for removing stains from teeth. 3,985,147, Cl. 132-89.000.

Ricketts, Robert M.: *See—*
Ricketts, Craig M.; and Ricketts, Robert M., 3,985,147.

Ricoh Co., Ltd.: *See—*
Suzuki, Shigeru; Kasahara, Nobuo; and Katagiri, Nobuyuki, 3,985,435.

Ridley, Spriggs and Johnson Limited: *See—*
Johnson, Martin Robert; and Hood, Arthur John, 3,985,004.

Rieper, Wolfgang: *See—*
Ribka, Joachim; Rieper, Wolfgang; and Zunker, Reinhard, 3,985,725.

Riffee, Lyle G.; and Horst, William R., to NCR Corporation. Machine readable merchandise marking tag. 3,985,293, Cl. 235-61.12N.

Riker Laboratories, Inc.: *See—*
Gerster, John F., 3,985,882.
Schuppan, Dietrich; Gerster, John F.; and Leir, Charles M., 3,985,753.

Riley, James H.; and O'Brien, Owen T., to Circle Seal Corporation. High resolution micro-metering valve. 3,985,331, Cl. 251-77.000.

Riley, John F.; and Stauffer, Edgar Eugene, to United States of America, Energy Research and Development Administration. Extinguishing agent for combustible metal fires. 3,985,658, Cl. 252-7.000.

Rineman, Harold J.: *See—*
Rineman, Richard Lynn, 3,985,090.

Rineman, Richard Lynn, to Rineman, Harold J.; and Young, S. Albert, part interest to each. Sport boat. 3,985,090, Cl. 114-39.000.

Rion Co., Ltd.: *See—*
Suzuki, Kazuma; and Kurosawa, Takahiro, 3,986,061.

Ripley, Dennis L.: *See—*
Finch, Jack N.; and Ripley, Dennis L., 3,985,641.

Rischar, Bernard J. Back pack chair. 3,985,387, Cl. 297-4.000.

Ritzie, Robert H., to Dow Chemical Company, The. Injection molding machine and method of operation thereof. 3,985,349, Cl. 259-191.000.

Riva, Donald A.: *See—*
Raymond, Brian W.; Riva, Donald A.; and Stuchberry, Frederick C., 3,984,920.

Rix, Albert; and Drogi, Dieter, to Olympia Werke KG. Tabulator apparatus for a typewriter carriage moving in steps of different length. 3,985,220, Cl. 197-177.000.

Robbins, Gordon Jay: *See—*
Eichelberger, Edward Baxter; and Robbins, Gordon Jay, 3,986,057.

Robbins, Mark L.: *See—*
Robbins, Samuel, 3,985,092.

Robbins, Samuel, to Robbins, Mark L. Sailboat traveler apparatus. 3,985,092, Cl. 114-204.000.

Robert Bosch G.m.b.H.: *See—*
Adam, Helmut; Lutz, Hans; and Siegle, Gert, 3,985,635.
Nonnenmacher, Gerhard; and Steinmann, Roland, 3,985,065.
Sandau, Hartmut, 3,985,197.

Roberts, Charles A., Jr.: *See—*
Conger, Robert L.; Menz, Frederic L.; and Roberts, Charles A., Jr., 3,985,077.

Roberts Industries, Inc.: *See—*
Snyder, Alan H., Jr., 3,985,458.

Robinson, Thomas C.: *See—*
Buck, Keith E.; Kitrilakis, Sotiris; and Robinson, Thomas C., 3,985,131.

Robinson, William Keith: *See—*
Boyce, Elvin L.; and Robinson, William Keith, 3,985,132.

Robison, William D.: *See—*
Kulesza, Stanley; and Robison, William D., 3,985,075.

Robustelli, Ciro M.: *See—*
Longenecker, John G.; Rubio, Manuel J.; and Robustelli, Ciro M., 3,985,070.

Rock, Howard P. Vented needle valve for carburetor idle port. 3,985,837, Cl. 261-41.00D.

Rockwell International Corporation: *See—*
Jovick, Raymond John, 3,985,393.
Padgett, Clarence W.; Luisi, James A.; and Street, Dana C., 3,986,042.

Rodriguez-Cantos, Delfos. Automated system for a dining room or mess. 3,985,206, Cl. 186-1.00R.

Rodth, Joseph John, to Coca-Cola Co., The. Gravity controlled beverage dispenser. 3,985,272, Cl. 222-205.000.

Rogakos, Deno J.; and Johnston, Lynn M., to General Motors Corporation. Energy absorbing coupling. 3,984,998, Cl. 64-27.00C.

Rohm and Haas Company: *See—*
Ferry, William J.; Jones, Donald H.; and Graham, Roger K., 3,985,703.
Jones, Donald H.; and Ferry, William J., 3,985,704.

Rohr Industries, Inc.: *See—*
Medawar, George E.; and Hom, Felix, 3,984,974.

Rohrbach, Roger P.; and Kim, Kun Ha, to Research Corporation. Apparatus and method for metering particles. 3,985,263, Cl. 221-1.000.

Rolfes, Marlan John, to Deere & Company. Tractor-implement control system. 3,985,394, Cl. 302-34.000.

Rolin, Robert J.; and Sales, Richard Arden. Telephone call restrictor. 3,985,972, Cl. 179-18.0DA.

Rolm Corporation: *See—*
Edwards, John D., 3,985,966.

Roman, Steven A.: *See—*
Powell, James E.; and Roman, Steven A., 3,985,736.

Roneo Vickers Limited: *See—*
Bonsch, Francois Henry Rudolphe, 3,985,074.

Roque, Perry, to Lawrence Peska Associates, Inc., a part interest. Rotatable dual hose assembly. 3,985,167, Cl. 141-392.000.

Rose, Ewald. Vaginal speculum. 3,985,125, Cl. 128-17.000.

Rosen, Leo. Rotors. 3,984,922, Cl. 35-4.000.

Rosenbauer, Hans-Gunter: *See—*
Aignesberger, Alois; Bornmann, Paul; Rosenbauer, Hans-Gunter; and Theissig, Hans, 3,985,696.

Rosenbaum, Fred J.: *See—*
Harris, Douglas H.; and Rosenbaum, Fred J., 3,986,149.

Ross, Abraham D. Sailboat stabilizing system. 3,985,106, Cl. 114-91.000.

Ross, David Gene; and Schnitzler, Paul, to Bell Telephone Laboratories, Incorporated. Class AB-dual push-pull amplifier. 3,986,131, Cl. 330-15.000.

Rossler, Frederick William, Jr.: *See—*
Dola, Frank Peter; and Rossler, Frederick William, Jr., 3,985,416.

Rotger, Heinrich: *See—*
Hauschild, Ulrich; Holst, Rudolf; Kaspers, Hans-Heinz; and Rotger, Heinrich, 3,985,537.

Rothmans of Pall Mall Canada Limited: *See—*
Brackmann, Warren A.; and Dilanni, Daniel, 3,985,481.

Rotta Research Laboratorium S.p.A.: *See—*
Makovec, Francesco; Senin, Paolo; and Rovati, Luigi, 3,985,878.

Rottier, Jacob, to U.S. Philips Corporation. High efficiency supply circuit for an electric discharge lamp. 3,986,076, Cl. 315-99.000.

Roux, Claude P.; and Torossian, Dieran Robert, to Jouveinal S.A. Pharmaceutical preparation for percutaneous treatment of local edemas employing acetazolamide. 3,985,892, Cl. 424-270.000.

Rovati, Luigi: *See—*
Makovec, Francesco; Senin, Paolo; and Rovati, Luigi, 3,985,878.

Rowell, Roger M.; and Gutzmer, David I., to United States of America, Agriculture. Treatment of wood with butylene oxide. 3,985,921, Cl. 427-317.000.

Rowlands, Tom: *See—*
Hinchcliffe, Dennis; Rowlands, Tom; and Hillman, James George Edward, deceased, 3,985,252.

Roza, Engel; and Millenaar, Peter Wilhelm, to U.S. Philips Corporation. Wide-band transistor amplifier. 3,986,133, Cl. 330-18.000.

Ruaud, Michel: *See—*
Chabert, Henri; Chapurlat, Robert; Gigou, Claude; and Ruaud, Michel, 3,985,718.

Rubio, Manuel J.: *See—*
Longenecker, John G.; Rubio, Manuel J.; and Robustelli, Ciro M., 3,985,070.

Rudkin, Henry A., Jr.: *See—*
Hildebrand, Mark L.; Rudkin, Henry A., Jr.; and Wiley, Nathaniel C., Jr., 3,984,950.

Rudkin-Wiley Corporation: *See—*
Hildebrand, Mark L.; Rudkin, Henry A., Jr.; and Wiley, Nathaniel C., Jr., 3,984,950.

Rudyk, Boris: *See—*
Kunda, Wasyl; Rudyk, Boris; and Kohut, Michael, 3,985,553.

Ruger, William B., to Sturm, Ruger & Co. Inc. Ejector arrangement for break-open firearm. 3,984,933, Cl. 42-47.000.

Ruggiero, Joseph E.: *See—*
Johnston, James J.; Angelico, Henry R.; Bedard, Walter J.; and Ruggiero, Joseph E., 3,984,912.

Ruggles, Arthur E.: *See—*
Hagen, Kenneth G.; Huffman, Fred N.; and Ruggles, Arthur E., 3,984,982.

Ruhland, Ingrid, legal representative: *See—*
Rheinlander, Paul; Mahn, Gustav; Berner, Klaus; Schulz, Klaus, deceased; and Ruhland, Ingrid, legal representative, 3,985,549.

Ruoff, Carl F., Jr., to Bendix Corporation, The. Method and apparatus for calibrating mechanical-visual part manipulating system. 3,986,007, Cl. 235-151.100.

Russell, Jerry L., to Eagle-Picher Industries, Inc. Lithium/fluorographite primary cell with improved electrolyte. 3,985,577, Cl. 429-194.000.

Russo, Joseph. Oscillator with blinking light emitting diode for ornamental ring. 3,986,144, Cl. 331-111.000.

Rybka, Bruno: *See—*
Borchard, Heinz; Kasch, Robert; Rybka, Bruno; and Knothe, Herbert, 3,985,521.

Ryzhikov, Igor Veniaminovich: *See—*
Vodakov, Jury Alexandrovich; Lomakina, Galina Alexandrovna; Mokhov, Evgeny Nikolaevich; Kruglov, Igor Ivanovich; Ryzhikov, Igor Veniaminovich; Pavlichenko, Vadim Ivanovich; Kmita, Tatyana Georgievna; Kholuyanov, Georgy Fedorovich; Violin, Eduard Efimovich; Maslakovets, Jury Petrovich, deceased; and Valter-Maslakovets, Irina Vladimirovna, administratrix, 3,986,193.

S&S Corrugated Paper Machinery Co., Inc.: *See—*
Kern, William M., 3,985,066.

Sackenreuter, Hans: *See—*
Politzer, Anton; Sackenreuter, Hans; and Machmer, Wilhelm, 3,985,059.

Sadeski, Boleslaus J.: *See—*
Balch, James L.; Anderson, James E.; and Sadeski, Boleslaus J., 3,985,052.

Safir, Sidney Robert: *See—*
Hofmann, Corris Mabelle; and Safir, Sidney Robert, 3,985,754.

Saito, Yutaka, to Toaseiko Co., Ltd. Sales computer utilizing sensor pairs. 3,986,001, Cl. 235-61.11E.

Saitoh, Kozo; and Izumi, Sumio, to Mitsui Mining & Smelting Co., Ltd. Method for separating plastics-containing mixture. 3,985,650, Cl. 210-44.000.

Sakaguchi, Kahei; and Takemoto, Hirotaka, to Kao Soap Co., Ltd. Toner composition for use in electrophotography comprising novel polyester binder resin. 3,985,664, Cl. 252-62.10R.

Sakaguchi, Kahei; Minakata, Masaaki; Takemoto, Hirotaka; and Takamori, Shigeru, to Kao Soap Co., Ltd. Toner composition for use in electrophotography comprising novel polyester binder resin. 3,985,665, Cl. 252-62.10R.

Sakauchi, Yoshiaki: *See—*
Yamada, Yasuhiro; Tsukamoto, Kazuyoshi; Sakauchi, Yoshiaki; and Ushijima, Kazufumi, 3,986,154.

Sales, Richard Arden: *See—*
Rolin, Robert J.; and Sales, Richard Arden, 3,985,972.

Salk Institute for Biological Studies, The: *See—*
Byrd, William J., 3,986,028.

Salle, Robert: *See—*
Cohen, Choua; Durif-Varambon, Bruno; Salle, Robert; and Sillion, Bernard, 3,985,711.

Sallen, Leroy H. Solar sensor-heater. 3,985,117, Cl. 126-271.000.

Salsbury Laboratories: *See—*
Hoffmann, Hermann; Held, Byron G.; Green, Harry E.; and Van Essen, Harold E., 3,985,724.

Saltman, William M.; and Auerbach, Melvin, to Goodyear Tire & Rubber Company, The. Polymeric compositions. 3,985,709, Cl. 260-47.0UA.

Salzer, Erwin; and George, Delbert L., to Chase-Shawmut Company, The. Electric fuse having substantially prismatic casing. 3,986,157, Cl. 337-186.000.

Salzer, Erwin, to Chase-Shawmut Company, The. Electric fuse having casing of synthetic-resin-glass-cloth laminate. 3,986,158, Cl. 337-246.000.

Samans, Cecelia; and Spatz, Martin R., to Standard Oil Company (Indiana). Stannous stabilization of maleic anhydride. 3,985,776, Cl. 260-346.80R.

Samejima, Tadanori: *See—*
Matsumura, Hisashi; Samejima, Tadanori; Orito, Hiroshi; and Ochiai, Hisashi, 3,984,898.

Samuelson, Donald G.; and Baxter, Charles A., to Textron, Inc. Engine and drive train suspension system for snowmobiles. 3,985,192, Cl. 180-5.00R.

Sandau, Hartmut, to Robert Bosch G.m.b.H. Hydrostatic power steering system. 3,985,197, Cl. 180-154.000.

Sandell, Richard P.: *See—*
Morgan, Barry S.; and Sandell, Richard P., 3,985,623.

Sanders, Robert N., to Ethyl Corporation. Method of producing a high strength composite of zircon. 3,985,557, Cl. 75-135.000.

Sandoz, Inc.: *See—*
Houlihan, William H.; and Nadelson, Jeffrey, 3,985,729.
Houlihan, William J., 3,985,799.
Kathawala, Faizulla G., 3,985,883.

Sandstrom, Paul H.: *See—*
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Sangray Corporation: *See—*
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Sankyo Company Limited: *See—*
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Sansonetti, James Anthony: *See—*
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Sanyo Electric Co., Ltd.: *See—*
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Yamada, Yasuhiro; Tsukamoto, Kazuyoshi; Sakauchi, Yoshiaki; and Ushijima, Kazufumi, 3,986,154.

Sarabhai Research Centre: *See—*
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Sasaki, Tohru; Ichii, Takao; and Terasaki, Shuji, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for continuously polarizing thermoplastic film. 3,985,914, Cl. 427-12.000.

Sasena, John J., to Eaton Corporation. Method for fence construction. 3,985,343, Cl. 256-47.000.

Sato, Akira: *See—*
Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,985,563.

Sato, Kohei, to Matsushita Electric Industrial Co., Ltd. Oil-immersed type flyback transformer device. 3,986,080, Cl. 317-100.000.

Saucy, Gabriel; and Scott, John William, to Hoffmann-La Roche Inc. Total steroid synthesis employing substituted isoxazole derivatives. 3,985,771, Cl. 260-340.900.

Sauer, Donald G., to National Can Corporation. Destacking assembly. 3,985,265, Cl. 221-221.000.

Sausse, Andre: *See—*
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Sawant, Ulhas S.: *See—*
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Davis, D. Carter; and Sawant, Ulhas S., 3,985,309.

Sawyer, Willard H.: *See—*
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Saxholm, Rolf. Supporting element for use in microbiological, serological, immunological, clinical-chemical and similar laboratory work. 3,985,608, Cl. 195-127.000.

Saxon, Robert: *See—*
Chang, Eugene Yue Chieh; and Saxon, Robert, 3,985,708.

Scelia, Richard P.; Fagan, Kenneth W.; and Protomastro, Michael G., to General Foods Corporation. Decaffeinated coffee of improved aroma and flavor. 3,985,905, Cl. 426-427.000.

Schachte, John J.: *See—*
Zankl, Frank; Kirkham, Edward E.; Stobbe, Richard E.; and Schachte, John J., 3,986,087.
Zankl, Frank; Kirkham, Edward E.; Stobbe, Richard E.; and Schachte, John J., 3,986,088.

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Schardt, Michael M.: *See—*
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Scheiding, Horst: *See—*
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Scheiter, Milton H.: *See—*
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Schering Corporation: *See—*
Daniels, Peter J. L., 3,985,727.

Scheuermann, Horst; and Augart, Dietmar, to BASF Aktiengesellschaft. 3-Amidinocoumarin dyes. 3,985,772, Cl. 260-343.20R.

Schilling, Guenther; and Dobson, Thomas A., to American Home Products Corporation. Purification of γ-oxo-2-dibenzofuranbutyric acid. 3,985,774, Cl. 260-346.20M.

Schlaeger, Gary D., to Burlington Northern Inc. Dunnage filler. 3,985,242, Cl. 214-10.50R.

Schlecht, Charles H., to Caterpillar Tractor Co. Internal retaining tabs for a filled piston. 3,984,904, Cl. 29-156.50R.

Schliep, Hans-Jochen: *See—*
Mehrhof, Werner; Pohlke, Rolf; Becker, Karl Heinz; and Schliep, Hans-Jochen, 3,985,881.

Schlossberg, Howard: *See—*
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Schlosser, James A.; and Trumbull, Walter A., to Dow Chemical Company, The. Sheet wrapper. 3,984,906, Cl. 29-157.00R.

Schlumberger Technology Corporation: *See—*
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Schmedemann, Walter: *See—*
Hecker, Wolfgang; Schmedemann, Walter; and Hartmann, Heinrich, 3,986,090.

Schmid, Herman Pius, to AB Bofors. Method of manufacturing mould members of polyurethane-bonded granular material. 3,985,699, Cl. 260-31.20N.

Schmid, Rolf; Lohse, Friedrich; Fatzer, Willy; and Batzer, Hans, to Ciba-Geigy Corporation. Adducts, containing epoxide groups, based on polyesterdicarboxylic acids. 3,985,825, Cl. 260-835.000.

Schmidt, Reinhard, to Westfalia Separator AG. Self-cleaning centrifuge drum with a piston valve defining one side of the sludge chamber. 3,985,292, Cl. 233-20.00A.

Schmitt, Armin, to Petzholdt, J. S. Apparatus for removing contaminents from cocoa and cocoa butter masses. 3,985,607, Cl. 159-6.00W.

Schmitt, Hans-Jurgen: *See—*
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Schmitt, James L.: *See—*
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Schmitz, Wolfgang: *See—*
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Schmitzer, Andreas. Vacuum film holder for X-ray films and intensifying foils. 3,986,035, Cl. 250-480.000.

Schneider, Abraham; and Stuart, Archibald P., to Sun Oil Company of Pennsylvania. Rubber containing acid-treated oils and its preparation. 3,985,701, Cl. 260-33.6AQ.

Schneider, Burnett M., to Aqua-Chem, Inc. Electrodialysis apparatus electrode system. 3,985,636, Cl. 204-301.000.

Schneidinger, Carl. Light switch actuating device. 3,985,982, Cl. 200-33.00R.

Schneiter, Fred E.; Thompson, Arnold R.; Davis, Leland E.; and Kirchoff, George F., Jr., to Thiokol Corporation. Gas generator. 3,985,076, Cl. 102-39.000.

Schnitzler, Paul: *See—*
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Schoeffel, Dietmar M.; and Sonnenschein, Armin K., to Schoeffel Instrument Corporation. Multi-channel spectral analyzer for liquid chromatographic separations. 3,985,441, Cl. 356-88.000.

Schoeffel Instrument Corporation: *See—*
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Scholz, Hans, to English Electric Valve Company Limited. Pick-up tubes. 3,986,070, Cl. 313-384.000.

Schon, Franz: *See—*
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Schrameyer, Arnold F. Splash guard and diverter for shower curtains. 3,984,880, Cl. 4-146.000.

Schreiner, Horst: *See—*
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Schroder, Henrik Anton, to A/S Fredriksstad mek. Verksted. Combined incinerator for oil sludge and solid wastes. 3,985,085, Cl. 110-8.00C.

Schroter, Herbert: *See—*
Dennhardt, Werner; and Schroter, Herbert, 3,985,440.

Schroth, Raymond A., to Presray Corporation, The. Inflatable closure seal for sliding doors. 3,984,942, Cl. 49-477.000.

Schulkin, William. Exercise device with spring biased telescoping members. 3,985,354, Cl. 272-134.000.

Schulte, Fritz, to Hartung, Kuhn & Co. Maschinenfabrik GmbH. Arrangement for charging the coal bins of hopper cars. 3,985,245, Cl. 214-41.00R.

Schulz, Klaus, deceased: *See—*
Rheinlander, Paul; Mahn, Gustav; Berner, Klaus; Schulz, Klaus, deceased; and Ruhland, Ingrid, legal representative, 3,985,549.

Schumann, Paul A., Jr.: *See—*
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Schuppan, Dietrich; Gerster, John F.; and Leir, Charles M., to Riker Laboratories, Inc. 7-Hydroxy-benzo[ij]quinolizine-2-carboxylic acids and derivatives thereof. 3,985,753, Cl. 260-287.00P.

Schuster, Hubert: *See—*
Knippschild, Gerd; and Schuster, Hubert, 3,985,862.

Schwabe, Eberhard A.; and Came, Donald M. System for generating magnetic images. 3,986,190, Cl. 346-74.100.

Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung: *See—*
Gessler, Hans; and Faul, Josef, 3,985,244.

Schwartz, Judd Leonard; and Mayer, Richard Eugene, to Allied Chemical Corporation. Flame-retardant carpet. 3,985,926, Cl. 428-97.000.

Schwartz, Robert. Oral implant. 3,984,914, Cl. 32-10.00A.

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SCM Corporation: *See—*
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Johnson, Lawrence A.; and Beyn, Edgar J., 3,985,913.
Kriz, Edward F.; and Oszlanyi, Antal G., 3,985,911.

Scott, John J., to Norton Company. Method of making electrical magnesia. 3,985,842, Cl. 264-12.000.

Scott, John William: *See—*
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Scotto, Vincent Anthony: *See—*
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Seals, Harold, to Kline, Larry Harold. Impeller shaft turning device. 3,985,471, Cl. 417-405.000.
Searight, Edward F.: *See—*
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Seefluth, Charles L., to Phillips Petroleum Company. Adjusting parison alignment by temperature control of picker finger. 3,985,850, Cl. 264-98.000.
Seidehamel, Richard J.; and Dungan, Kendrick W., to Mead Johnson & Company. Ocular hypotensive process employing dextrorotatory sulfonamidophenethanolamines. 3,985,897, Cl. 424-321.000.
Seismograph Service Corporation: *See—*
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Sellers, Bach, to United States of America, Navy. Inverted voltage Gerdien Condenser. 3,986,111, Cl. 324-71.00R.
Selvia, Ray E.; and Barden, Allan D., to All State Vending Equipment, Inc. Logic and selector circuitry for flavored-beverage dispensing apparatus. 3,985,267, Cl. 222-70.000.
Senes, Michel; Pottier, Michel; and Courdier, Jean-Francois, to Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques. Catalyst for the oxidation of ammonia. 3,985,681, Cl. 252-462.000.
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, to Bayer Aktiengesellschaft. Antibacterial compositions containing a 4-aminopyrimido-(4,5,b)-quinoxaline-5,10-dioxide and method of using same. 3,985,879, Cl. 424-251.000.
Senin, Paolo: *See—*
Makovec, Francesco; Senin, Paolo; and Rovati, Luigi, 3,985,878.
Sepmeyer, Ludwig W. Background sound system and apparatus for masking speech. 3,985,200, Cl. 181-150.000.
Seragnoli, Enzo, to G. D. Societa per Azioni. Device for sealing overwraps of packages. 3,984,963, Cl. 53-77.000.
Serizawa, Hiroyuki: *See—*
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Severson, Gerald R.: *See—*
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Seymour, Shaun A., to Sperry Rand Corporation. Bale retrieving and transporting apparatus. 3,985,246, Cl. 214-82.000.
Shackle, Dale Richard, to Mead Corporation, The. Cyclopolymethylenefluoran compounds. 3,985,930, Cl. 428-307.000.
Shaffer, James B.; Tomo, Daniel; and Strohecker, Chester, to National Distillers and Chemical Corporation. Blow molded industrial drum. 3,985,257, Cl. 220-1.00R.
Shapiro, Stanley; and Lanam, Richard D., to Olin Corporation. Processing copper base alloys. 3,985,589, Cl. 148-160.000.
Sharp Kabushiki Kaisha: *See—*
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Shaw, Adele G.: *See—*
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Shaw, Joseph Denman; and Shaw, Adele G. Security system for controlled drugs. 3,985,264, Cl. 221-7.000.
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Shea, Donald Ray, to Bell Telephone Laboratories, Incorporated. Preference access circuit. 3,985,973, Cl. 179-18.0ET.
Shefsiek, Paul K.: *See—*
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Sheldon, Donald E.; and Shuttleworth, Richmond G., to United Technologies Corporation. Turbomachine with removable stator vane. 3,985,465, Cl. 415-189.000.
Shell Oil Company: *See—*
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Sherman, Charles A., to Weyerhaeuser Company. Vibratory seedling cleaner. 3,985,233, Cl. 209-104.000.
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Sherritt Gordon Mines Limited: *See—*
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Sherwin-Williams Company, The: *See—*
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Shilling, John P.; and Sherrill, Derold L., to Eaton Corporation. Locking device for a differential drive mechanism. 3,985,045, Cl. 74-711.000.
Shimadzu Seisakusho Ltd.: *See—*
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Shimanaka, Hiroshi; Ichida, Toshio; and Kobayashi, Shigeru, to Kawasaki Steel Corporation. Method for forming an insulating coating on an oriented silicon steel sheet. 3,985,583, Cl. 148-6.160.
Shimizu, Masanao: *See—*
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Shipek, Edward J.: *See—*
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Shishido, Takashi: *See—*
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Shoemaker, Donald. Game. 3,985,355, Cl. 273-3.00A.
Short, David J., to Gibson Battle & Co. Limited. Sequencer unit. 3,986,038, Cl. 307-47.000.
Shuck, Edward E.; and Hudson, Neil. Portable set for automatic sequential test of multiple wire pairs. 3,986,106, Cl. 324-51.000.
Shuttleworth, Richmond G.: *See—*
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SIKOB Svensk Industris Konstrucktions och Berakningskontor AB: *See—*
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Silaev, Alexandr Fedorovich; Matjushenko, Raisa Stepanovna; Popova, Larisa Nikolaevna; Kurganov, Vasily Alexandrovich; Markin, Mikhail Ivanovich; Kurakin, Viktor Ivanovich; Fatjuk, Nina Maximovna; and Nazarova, Anna Kapitonovna. Nickel-base metal-ceramic heat-resistant sealing material. 3,985,513, Cl. 29-182.500.
Sillion, Bernard: *See—*
Cohen, Choua; Durif-Varambon, Bruno; Salle, Robert; and Sillion, Bernard, 3,985,711.
Simpson, Harold H., to Sybron Corporation. Dental alloy and amalgam. 3,985,558, Cl. 75-169.000.
Simpson, Harold H.: *See—*
Ebbert, Robert; and Simpson, Harold H., 3,985,307.
Simpson Manufacturing Co., Inc.: *See—*
Gilb, Tyrell T., 3,985,459.
Sindelar, Karel: *See—*
Protiva, Miroslav; Jilek, Jiri; Sindelar, Karel; and Metysova, Jirina, 3,985,750.
Singer Company, The: *See—*
Eisenberg, Robert M., 3,985,969.
Herr, John Addison; and Porter, Oswald Mead, 3,985,087.
Mecklenborg, Richard A.; and McClenahan, Richard E., 3,985,422.
Myles, Walter Edward; and Sansonetti, James Anthony, 3,984,924.
Siracusa, Mario: *See—*
Kuno, Hiromu John; Chang, Yu-Wen; and Siracusa, Mario, 3,986,153.

Sitton, Willard J., to ACF Industries, Incorporated. Apparatus for coating workpieces with a plastic material. 3,985,097, Cl. 118-425.000.
Skanes, Frederick A.: *See—*
Aker, Ludwig E.; and Skanes, Frederick A., 3,985,249.
SKF Industrial Trading and Development Company, B.V.: *See—*
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 3,985,215.
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Lankamp, Herman, 3,985,660.
Ski Safe Inc.: *See—*
Pyzel, Ewald D.; and Codding, Harold E., 3,985,371.
Skidmore, Richard H., to W Bar E, Incorporated. Apparatus and method for feeding a powdery material to a plasticized, pressurized polymer. 3,985,348, Cl. 259-191.000.
Slusarchyk, William A.: *See—*
Koster, William Henry; Slusarchyk, William A.; and Bernstein, Jack, 3,985,746.
Smith, Bradford Knox, to RCA Corporation. Yoke mount assembly. 3,986,156, Cl. 335-210.000.
Smith, Calvin C.: *See—*
Hart, Edward J.; Leeman, James E.; MacDougall, Hugh R.; Marron, John J.; and Smith, Calvin C., 3,985,078.
Smith, Cecil J. Portable apparatus for use on a wrecked vehicle by a rescue squad. 3,985,014, Cl. 72-457.000.
Smith, Charles W.; and Dyer, Mahlon D., to GTE Sylvania Incorporated. Data acquisition system for spectrophotometer. 3,985,442, Cl. 356-96.000.
Smith, Clyde, to Thomson-CSF Laboratories, Inc. Video synchronizing apparatus and method. 3,986,204, Cl. 358-22.000.
Smith, Douglas E.: *See—*
Griffin, Lawrence C.; Peters, Homer D. F.; and Smith, Douglas E., 3,985,026.
Smith, Douglas H.: *See—*
Poole, John S.; Muhlestein, H. Blair; Smith, Douglas H.; and Bilen, Lennart, 3,986,011.
Smith, John Francis, to Arrow Vale Egg Producers Limited. Apparatus for dispensing animal foodstuffs. 3,985,105, Cl. 119-52.00B.
Smith, Jopling P., to Keystone International, Inc. Valve actuator. 3,985,151, Cl. 137-269.000.
Smith, Maurice N.; and Huang, Kwang-Ta, to United States of America, Navy. Transient source and direction of propagation detector. 3,986,116, Cl. 324-102.000.
Smith, Milbourn L., to Continental Can Company, Inc. Cleated conveyor belt. 3,985,647, Cl. 209-218.000.
Smith, Thomas M.: *See—*
Carter, Donald J.; Hoffman, Garry S.; and Smith, Thomas M., 3,986,084.
SmithKline Corporation: *See—*
Bennett, Russell B.; Campbell, Clair E.; and Pritz, Howard B., 3,985,535.
Brenner, L. Martin; and Brush, Charles K., 3,985,896.
Dunn, George L.; and Hoover, John R. E., 3,985,739.
Kaiser, Carl; and Wardell, Joe R., Jr., 3,985,887.
Smithson, Douglas James, to British Steel Corporation. Bag filter installation. 3,985,527, Cl. 55-341.00R.
Smrt, Thomas John. Folded bag handle. 3,985,290, Cl. 229-54.00R.
Snam Progetti S.p.A.: *See—*
Girotti, Pier Leone; Tesei, Renato; and Floris, Telemaco, 3,985,821.
Snuggs, Wiley P.: *See—*
McElroy, David J.; and Snuggs, Wiley P., 3,986,178.
Snyder, Alan H., Jr., to Roberts Industries, Inc. Locking device. 3,985,458, Cl. 403-111.000.
Snyder, George A.: *See—*
Vlnaty, Joseph; Snyder, George A.; and Anthes, John A., 3,985,543.
Sobajima, Katsunobu: *See—*
Akiyama, Yoshinori; Matsumoto, Toshinori; and Sobajima, Katsunobu, 3,985,193.
Sobel, Jay E.; and Vora, Bipin V., to UOP Inc. Isoparaffin-olefin alkylation with HF alkylation and isomerization in a soaking zone. 3,985,823, Cl. 260-683.420.
Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, 3,985,794.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Monti, Giancarlo; and Poretti, Isidoro, 3,985,956.
Tirro, Sebastiano; Cafissi, Roberto; and Cavalieri d'Oro, Enzo, 3,986,123.
Societe Anonyme de Telecommunications: *See—*
Boutmy, Patrick Emile; and Walraet, Jean Gaston, 3,985,963.
Societe Anonyme dite: Etablissements Genoud & Cie.: *See—*
Neyret, Guy, 3,985,493.
Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine: *See—*
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Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques: *See—*
Senes, Michel; Pottier, Michel; and Courdier, Jean-Francois, 3,985,681.
Societe des Plastiques BRENEZ: *See—*
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Societe d'Etudes, Recherches et Constructions Electroniques - SERCEL: *See—*
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Societe d'Exploitation des Brevets Neiman S.A.: *See—*
Lipschutz, Paul, 3,985,009.
Societe Lignes Telegraphiques et Telephoniques: *See—*
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Societe Mobiliere Industrielle: *See—*
Grandury, Yves, 3,985,254.
Societe Nationale des Poudres et Explosifs: *See—*
De Taffin, Francois; and Plazanet, Jacques, 3,985,691.
Sola Basic Industries, Inc.: *See—*
Werych, Ewald R., 3,985,946.
Soletanche: *See—*
Portier, Jean-Louis, 3,984,988.
Solvay & Cie: *See—*
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Somasekhara, Shankar; Desai, Dinesh Maganlal; and Upadhyaya, Navinchandra Vasantrai, to Sarabhai Research Centre. Nitrothiazolyl derivatives of nitrostyrene. 3,985,761, Cl. 260-302.00R.
Sommer, Manfred. Rotary piston pump. 3,985,479, Cl. 418-146.000.
Sonnenberg, Rudolph, to Crisci, Harry. Device for applying caps to bottles. 3,984,965, Cl. 53-331.500.
Sonnenschein, Armin K.: *See—*
Schoeffel, Dietmar M.; and Sonnenschein, Armin K., 3,985,441.
Sonntag, Alois: *See—*
Herold, Ludwig; Pikorz, Wolfgang; and Sonntag, Alois, 3,986,201.
Sontheimer, Carl G. Rotary food processing apparatus. 3,985,304, Cl. 241-92.000.
Sontrix, Inc.: *See—*
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Sony Corporation: *See—*
Arai, Michio, 3,986,195.
Hongu, Masayuki; and Kawakami, Hiromi, 3,986,058.
Hongu, Masayuki; and Tada, Masahiro, 3,986,145.
Kuniyoshi, Yasunobu; and Tsuchiya, Takao, 3,985,954.
Okada, Takashi; and Utsunomiya, Kimitake, 3,986,048.
Okada, Takashi; and Utsunomiya, Kimitake, 3,986,051.
Soures, John Michael; and Hoose, John Frederick, to University of Rochester. Laser apparatus. 3,986,130, Cl. 330-4.300.
Southern Oxygen Supply Company: *See—*
Nelson, Thomas L., 3,985,161.
Spatz, Martin R.: *See—*
Samans, Cecelia; and Spatz, Martin R., 3,985,776.
Specker, Manfred: *See—*
Metz, Gunter; and Specker, Manfred, 3,985,790.
Spectus Oil Burner, Ltd.: *See—*
Tindall, David, 3,985,301.
Speech, Steven R., to Minnesota Mining and Manufacturing Company. Poly (urethane-urea) foam sealants for underground application and fluid precursors. 3,985,688, Cl. 260-2.5AP.
Spenkelink, Gerrit Johan Hendrik: *See—*
Tijsma, Sjoerd; and Spenkelink, Gerrit Johan Hendrik, 3,986,092.
Sperry Rand Corporation: *See—*
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Seymour, Shaun A., 3,985,246.
Wagstaff, Robert A.; and Lausch, Henry N., 3,985,306.
Yatcilla, George E., 3,984,969.
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Sperry Univac Corporation: *See—*
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Spiegelberg, Annemarie, heiress: *See—*
Edenhofer, Albrecht; Spiegelberg-Schoop, Hans, deceased; Spiegelberg, Annemarie, heiress; Spiegelberg-Schoop, Anna, heiress; and Spiegelberg-Von der Crone, Hans, heir, 3,985,785.
Spiegelberg-Schoop, Anna, heiress: *See—*
Edenhofer, Albrecht; Spiegelberg-Schoop, Hans, deceased; Spiegelberg, Annemarie, heiress; Spiegelberg-Schoop, Anna, heiress; and Spiegelberg-Von der Crone, Hans, heir, 3,985,785.
Spiegelberg-Schoop, Hans, deceased: *See—*
Edenhofer, Albrecht; Spiegelberg-Schoop, Hans, deceased; Spiegelberg, Annemarie, heiress; Spiegelberg-Schoop, Anna, heiress; and Spiegelberg-Von der Crone, Hans, heir, 3,985,785.
Spiegelberg-Von der Crone, Hans, heir: *See—*
Edenhofer, Albrecht; Spiegelberg-Schoop, Hans, deceased; Spiegelberg, Annemarie, heiress; Spiegelberg-Schoop, Anna, heiress; and Spiegelberg-Von der Crone, Hans, heir, 3,985,785.
Spillekothen, Hans-Gerd: *See—*
Klar, Erich; Spillekothen, Hans-Gerd; and Haller, Pierre, 3,986,032.
Spinner, Georg. H.F. cable socket. 3,985,418, Cl. 339-177.00R.
Spitz, Melvin P. Bed frame having releasably interlocked side rails and crossbars. 3,984,884, Cl. 5-176.00R.
Spitzer, Wayne A., to Eli Lilly and Company. 3-Sulfonate esters of cephalosporin. 3,985,737, Cl. 260-243.00C.
Splisteser, Karl-Heinz: *See—*
Brock, Albert; Splisteser, Karl-Heinz; and Dobbrunz, Werner, 3,984,894.
Spoelder, Gerrit Adriaan, to U.S. Philips Corporation. Storage system comprising a main store and a buffer store. 3,986,171, Cl. 340-172.500.
SPOFA, Sdruzeni podniku pro zdravotnickou vyrobu: *See—*
Protiva, Miroslav; Jilek, Jiri; Sindelar, Karel; and Metysova, Jirina, 3,985,750.

Spraying Systems Co.: *See—*
Paulsen, Gary Allen, 3,985,333.
Springer, Harvey G.: *See—*
Wolgamot, Chet; and Springer, Harvey G., 3,984,939.
Sprunck, Emile: *See—*
Leroy, Pierre; and Sprunck, Emile, 3,985,350.
Squassoni, Gino F.: *See—*
Urbanek, Edwin A.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vsevolod; Teumer, Roger G.; and Egnaczak, Raymond K., 3,985,434.
Srinivasan, Rangaswamy: *See—*
Angadiyavar, Channabasappa S.; and Srinivasan, Rangaswamy, 3,986,140.
Stachurski, Zbigniew; and Yardney, Michel N., to Yardney Electric Corporation. Cell with circulating electrolyte. 3,985,581, Cl. 429-51.000.
Stahlwerke Peine-Salzgitter Aktiengesellschaft: *See—*
Rheinlander, Paul; Mahn, Gustav; Berner, Klaus; Schulz, Klaus, deceased; and Ruhland, Ingrid, legal representative, 3,985,549.
Staker, Walter L.: *See—*
Shirts, Monte B.; and Staker, Walter L., 3,985,555.
Standard Oil Company (Indiana): *See—*
Cengel, John A.; and Puskas, Imre, 3,985,672.
Piasek, Edmund J.; and Karll, Robert E., 3,985,802.
Samans, Cecelia; and Spatz, Martin R., 3,985,776.
Stanley, Theodore H.; and Foote, Jerrold L., to University of Utah, The. Inflation and pressure relief valve. 3,985,141, Cl. 128-351.000.
Stant Manufacturing Company, Inc.: *See—*
Evans, John H., 3,985,260.
Stapley, Edward O.; and Mata, Justo M., to Merck & Co., Inc. Process for preparing 3-hydroxymethyl cephalosporins. 3,985,742, Cl. 260-243.00C.
Starr, Robert H.; and Starr, Robert L. Method and apparatus for the treatment of air. 3,984,995, Cl. 62-305.000.
Starr, Robert L.: *See—*
Starr, Robert H.; and Starr, Robert L., 3,984,995.
Stauffer, Edgar Eugene: *See—*
Riley, John F.; and Stauffer, Edgar Eugene, 3,985,658.
Stearns Product Development Corporation: *See—*
Raio, Eugene L.; and Kennedy, Andrew P., 3,984,960.
Stedman, Robert N., to Caterpillar Tractor Co. Mid-carry loader. 3,985,247, Cl. 214-140.000.
Steele, Vernon P. Extension attachment device for a power tool. 3,985,188, Cl. 173-170.000.
Steensma, Peter D., to International Telephone and Telegraph Corporation. Holographic telephone switching system. 3,985,975, Cl. 179-18.0GF.
Steimle, Wayne D. Hydromassage device with directional jet control. 3,985,303, Cl. 239-428.500.
Stein Industrie: *See—*
Delaplace, Lucien, 3,985,084.
Steinacher, Ken, to Lawrence Peska Associates, Inc., a part interest. Panoramic rear viewing system. 3,985,424, Cl. 350-96.0BC.
Steinberg, Mitchell I.: *See—*
Holland, Donald R.; and Steinberg, Mitchell I., 3,985,893.
Steiner-Film Inh. Siegfried Steiner: *See—*
Steiner, Siegfried, 3,985,430.
Steiner, Siegfried, to Steiner-Film Inh. Siegfried Steiner. Image viewing apparatus. 3,985,430, Cl. 353-61.000.
Steingroever, Erich, to Magnetfabrik Bonn GmbH vorm. Gewerkschaft Windhorst. Process for producing crystal-oriented permanent magnets. 3,985,596, Cl. 156-6.000.
Steingroever, Erich, to Magnetfabrik Bonn GmbH vorm. Gewerkschaft Windhorst. Process for molding ring magnets for radially oriented particles. 3,985,843, Cl. 264-24.000.
Steingroever, Erich: *See—*
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Steinmann, Roland: *See—*
Nonnenmacher, Gerhard; and Steinmann, Roland, 3,985,065.
Stelzenmuller, William K.; and Walker, Ernest L., to International Business Machines Corporation. Multiplex data communications using acoustical surface wave filters. 3,985,968, Cl. 179-15.0BC.
Stelzenmuller, William K.: *See—*
Gindi, Abraham M.; Hong, Ju-Hi J.; and Stelzenmuller, William K., 3,986,126.
Stenkvist, Sven-Einar, to Allmanna Svenska Elektriska Aktiebolaget. Direct-current arc furnace. 3,985,945, Cl. 13-11.000.
Stenzel, Jurgen, to Hoechst Aktiengesellschaft. Catalyst for reducing the toxic contaminants of combustion engine exhaust gas. 3,985,683, Cl. 252-466.00J.
Stepe, Visvaldis A.: *See—*
Meyer, David L.; and Stepe, Visvaldis A., 3,984,929.
Stephan, John Thomas. Urea-treating fish egg bait in acid medium. 3,985,900, Cl. 426-1.000.
Steppan, Hartmut: *See—*
Buhr, Gerhard; and Steppan, Hartmut, 3,985,566.
Sterling Drug Inc.: *See—*
Bailey, Denis M., 3,985,539.
Stetler, Dwight L. Carton. 3,985,287, Cl. 229-37.00R.
Stobbe, Richard E.: *See—*
Zankl, Frank; Kirkham, Edward E.; Stobbe, Richard E.; and Schachte, John J., 3,986,087.
Zankl, Frank; Kirkham, Edward E.; Stobbe, Richard E.; and Schachte, John J., 3,986,088.
Stockton, Thomas R., to Ford Motor Company. Four speed manual transmission with concentric input and output shafts. 3,985,044, Cl. 74-710.500.
Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Freidrich; Vater, Wulf; and Stoepel, Kurt, 3,985,886.
Stogner, Ralph A.: *See—*
Zell, George A.; and Stogner, Ralph A., 3,985,259.
Stohr, Jean-Francois: *See—*
Bibring, Herve; Trottier, Jean-Pierre; Khan, Tasadduq; Stohr, Jean-Francois; and Rabinovitch, Maurice, 3,985,582.
Stoll, Max: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,985,906.
Stoll, Paul, to Bristol-Myers Canada Limited. Bottle packing system. 3,984,964, Cl. 53-161.000.
Stone Container Corporation: *See—*
Meyer, Melvin H.; and Weitzel, Gerald Gordon, 3,985,230.
Stora Kopparbergs Bergslags Aktiebolag: *See—*
Collin, Per Harald; and Johansson, Folke Karl Evald, 3,985,544.
Storrs, Kindred L. Process for separating and recovering liquid products from solid and liquid substances. 3,985,637, Cl. 208-8.000.
Straub, Henrik H., to United States of America, Air Force. Fluidic antiskid circuit. 3,985,398, Cl. 303-21.0CG.
Streck, Clemens, to GAF Corporation. Black dye formulation. 3,985,500, Cl. 8-25.000.
Streckfus, Frederick M. Tool for cutting helix grooves into rubber roll covers. 3,985,049, Cl. 82-36.00R.
Street, Dana C.: *See—*
Padgett, Clarence W.; Luisi, James A.; and Street, Dana C., 3,986,042.
Streigler, Helmut: *See—*
von Bonin, Wulf; and Streigler, Helmut, 3,985,929.
Stricker, John G., to United States of America, Navy. Series waterjet propulsion pumps for marine vehicles. 3,985,094, Cl. 115-14.000.
Strobel, Wolfgang: *See—*
Lederer, Michael; Strobel, Wolfgang; and Jastrow, Horst, 3,985,824.
Strohecker, Chester: *See—*
Shaffer, James B.; Tomo, Daniel; and Strohecker, Chester, 3,985,257.
Stuart, Archibald P.: *See—*
Schneider, Abraham; and Stuart, Archibald P., 3,985,701.
Stuart, Donald J., to Midland Engineering and Machine Co. Hand operated taping machine for coils. 3,985,311, Cl. 242-7.080.
Stuart, James H., to Sangray Corporation. Transfer process and composite sheet therefor. 3,985,602, Cl. 156-235.000.
Stuchberry, Frederick C.: *See—*
Raymond, Brian W.; Riva, Donald A.; and Stuchberry, Frederick C., 3,984,920.
Sturm, Ruger & Co. Inc.: *See—*
Ruger, William B., 3,984,933.
Suddeutsche Kalkstickstoff-Werke AG: *See—*
Aignesberger, Alois; Bornmann, Paul; Rosenbauer, Hans-Gunter; and Theissig, Hans, 3,985,696.
Suga, Shigeru. Carbon arc lamp provided with means to prevent ash deposition. 3,986,063, Cl. 313-46.000.
Sugahara, Masato. Cloth feed device for blind stitch sewing machine. 3,985,088, Cl. 112-178.000.
Suganuma, Kazuhide: *See—*
Matsumoto, Ryohei; Suganuma, Kazuhide; and Takahashi, Satoru, 3,985,108.
Sugaya, Hiroshi; Ishihara, Takeshi; Kobayashi, Fukashi; and Kanai, Kenji, to Matsushita Electric Industrial Co., Ltd. Magnetic head device using printed circuit techniques. 3,986,210, Cl. 360-123.000.
Suggitt, Robert M.; and Paull, Peter L., to Texaco Inc. Catalytic cracking process. 3,985,639, Cl. 208-120.000.
Sugiyama, Masayoshi: *See—*
Notomi, Ryohta; Shigeyoshi, Tuyoshi; and Sugiyama, Masayoshi, 3,985,849.
Sullivan, Ennis Cornelius, II. Rail transportation system. 3,985,081, Cl. 104-23.0FS.
Sumitomo Bakelite Company, Limited: *See—*
Watanabe, Tsutomu; and Yamaoka, Sigenori, 3,985,928.
Sumitomo Chemical Company, Limited: *See—*
Kobayashi, Katsumi; Dohgane, Iwao; Okabe, Hiromichi; and Tanimoto, Kenji, 3,985,819.
Sumitomo Denki Kogyo K.K.: *See—*
Hirai, Akiyoshi; Ishikawa, Masakazu; Ito, Sadayoshi; and Noguchi, Takeshi, 3,986,164.
Sumitomo Electric Industries, Ltd.: *See—*
Ikeda, Hirosaka; and Ishikawa, Masaki, 3,985,661.
Summers, James B.; and Bourke, Robert E., to NBS, Inc. Club protecting cover for golf bag. 3,985,171, Cl. 150-52.00G.
Sun Oil Company (Delaware): *See—*
Chaney, Preston E., 3,984,918.
Sun Oil Company of Pennsylvania: *See—*
Kirk, Merritt C., Jr., 3,985,638.
Schneider, Abraham; and Stuart, Archibald P., 3,985,701.
Sun Shipbuilding and Dry Dock Company: *See—*
Light, Stanley C., Jr., 3,984,987.
Sun Ventures, Inc.: *See—*
Norton, Richard V., 3,985,805.
Sunds Aktiebolag: *See—*
Leffler, Nils Gustav, 3,985,005.

Surakka, Jorma: *See—*
Eloranta, Kalevi; Lindroos, Raimo; and Surakka, Jorma, 3,985,994.

Surface Systems, Inc.: *See—*
Overall, Wilson W.; and Waldman, Jerry R., 3,986,110.

Surmatis, Joseph Donald, to Hoffmann-La Roche Inc. Method for the preparation of the copper complex of 6-methoxy-1-phenazinol 5,10-dioxide. 3,985,734, Cl. 260-242.000.

Sutton, Evelyn L. Article of clothing. 3,984,876, Cl. 2-48.000.

Suzuki, Kazuma; and Kurosawa, Takahiro, to Rion Co., Ltd. Piezoelectric ignition device. 3,986,061, Cl. 310-9.800.

Suzuki, Masayasu; Hoshino, Mitsuru; and Ohya, Masaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Regulation of the degree of polymerization of vinyl or vinylidene monomers with 2,5-dihydrofurans. 3,985,942, Cl. 526-270.000.

Suzuki, Shigeru; Kasahara, Nobuo; and Katagiri, Nobuyuki, to Ricoh Co., Ltd. Color electrophotographic apparatus. 3,985,435, Cl. 355-4.000.

Suzuki, Shigeru, to Nihon Kogen Concrete Kabushiki Kaisha. Device for producing prestressed concrete member. 3,985,482, Cl. 425-111.000.

Svoboda, Gordon H., to Eli Lilly and Company. Method of inhibiting growth of transplanted tumor cells. 3,985,899, Cl. 424-257.000.

Swenson, Carl Richard; Naughton, Frank C.; and Franco, Armando, to NL Industries, Inc. Pigment suspending agents in paint systems. 3,985,568, Cl. 106-171.000.

Swift and Company Limited: *See—*
Newman, Jack R., 3,985,651.

Sword, Geoffrey; Lawrence, John Leslie; Raggett, Stephen Richard; and Blakemore, Bernard, to Colourvision Associates. Control apparatus for electric motors. 3,986,089, Cl. 318-326.000.

Sybron Corporation: *See—*
Ebbert, Robert; and Simpson, Harold H., 3,985,307.
Simpson, Harold H., 3,985,558.
Travis, David, 3,985,920.

Sykes Datatronics, Inc.: *See—*
Sykes, John R., 3,986,208.

Sykes, John R., to Sykes Datatronics, Inc. Data recording with high speed search capability. 3,986,208, Cl. 360-49.000.

Sykes, Robert C.; and Vartiak, Joseph F., to Nalco Chemical Company. Control of overspray in solvent system paints. 3,985,692, Cl. 260-22.0CB.

Syntex (U.S.A.) Inc.: *See—*
Muchowski, Joseph M.; and Fried, John H., 3,985,791.

Tada, Masahiro: *See—*
Hongu, Masayuki; and Tada, Masahiro, 3,986,145.

Tagnon, Luc Andre, to Essilor International (Compagnie Generale d'Optique). Apparatus for measuring frontal power of contact lenses. 3,985,445, Cl. 356-125.000.

Takagi, Teiitsu: *See—*
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Takahashi, Masaaki; Ito, Akira; Igarashi, Yuriko; Kawada, Shichiro; Ogura, Jiro; and Ito, Ryoichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Dielectric ethylene copolymer compositions containing alkylfluoranthene. 3,985,938, Cl. 526-1.000.

Takahashi, Satoru: *See—*
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Takaishi, Naotake: *See—*
Inamoto, Yoshiaki; Nakayama, Hirokazu; and Takaishi, Naotake, 3,985,803.

Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener stringer with a zigzag-shaped continuous coupling element. 3,984,901, Cl. 24-205.16C.

Takamori, Shigeru: *See—*
Sakaguchi, Kahei; Minakata, Masaaki; Takemoto, Hirotaka; and Takamori, Shigeru, 3,985,665.

Takao, Haruo. Gilling machine. 3,984,897, Cl. 19-129.00R.

Takase, Tsutomu: *See—*
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Takashima, Matsuo; Ohtsuka, Minoru; and Matsumoto, Kazuya, to Canon Kabushiki Kaisha. Highly sensitive process for measuring fine deformation. 3,985,444, Cl. 356-109.000.

Takeda, Hideichi, to Yoshida Kogyo Kabushiki Kaisha. Exterior window unit having adapter sill plate. 3,984,954, Cl. 52-202.000.

Takei, Haruo: *See—*
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Takeyama, Kunihiko: *See—*
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Takita, Kiyoshi: *See—*
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Takiura, Mamoru, to Ikegai Tekko Kabushiki Kaisha. Method of molding synthetic resins materials through high-pressure fluid cross-linking process and relevant apparatus. 3,985,484, Cl. 425-145.000.

Tamii, Seizo; and Takeuchi, Muneaki, to Mitsubishi Denki Kabushiki Kaisha. Power conversion system. 3,986,098, Cl. 321-45.00R.

Tamir, Menachem; Martin, Manuel I.; and Magill, Robert J., to G. D. Searle & Co. Dosing apparatus. 3,985,165, Cl. 141-21.000.

Tamura, Hifumi: *See—*
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Tanaka, Satoru; Hashimoto, Kazunori; Watanabe, Hideaki; and Munakata, Keiichi, to Eisai Co., Ltd. M-phenoxyphenyl propionic acid derivatives and preparation thereof. 3,985,779, Cl. 260-448.00R.

Tanaka, Susumu; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus. 3,985,436, Cl. 355-8.000.

Tanaka, Toshiharu; and Akimoto, Masao, to Matsushita Electric Industrial Co., Ltd. Reed type electromechanical filter device. 3,986,150, Cl. 333-71.000.

Tanaka, Yoshiaki: *See—*
Komine, Shigeharu; Tanaka, Yoshiaki; and Kuzuya, Shiro, 3,985,959.

Tanemoto, Keigo. Portable collapsible boat. 3,984,887, Cl. 9-2.00C.

Tanimoto, Kenji: *See—*
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Taw, Harry: *See—*
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Taylor, Fred W. Flash reactor unit. 3,985,510, Cl. 23-284.000.

Taylor, John Anthony: *See—*
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Taylor, Paul D.; Conciatori, Anthony B.; and Jones, Rufus S., Jr., to Celanese Corporation. Transition metal catalyst supported on particulate high surface area BBB type polymer. 3,985,679, Cl. 252-430.000.

Taylor, Ray D., to B. F. Goodrich Company, The. Preparation of thiocarbamylsulfenamides. 3,985,743, Cl. 260-246.00B.

Taylor, Russell J., Jr.: *See—*
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TED Bildplatten Aktiengesellschaft: *See—*
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Tekade Felten & Guilleaume Fernmeldeanlagen GmbH: *See—*
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Teltscher, Erwin S. Eye-motion operable keyboard-accessory. 3,986,030, Cl. 250-349.000.

Tennessee Valley Authority: *See—*
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Terada, Fumio; Omori, Shigenori; Takahashi, Kihei; and Ida, Hiroshi, to Yoshida Kogyo Kabushiki Kaisha. Method and apparatus for manufacturing helically coiled coupling elements for slide fasteners. 3,984,970, Cl. 57-1.00R.

Terasaki, Shuji: *See—*
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Tesei, Renato: *See—*
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Thermo Electron Corporation: *See—*
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Thomas, Edwin Paul, to Bell Telephone Laboratories, Incorporated. Apparatus and method for measuring capacitance. 3,986,108, Cl. 324-60.00C.
Thomas, Jack A.: *See—*
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Thomas, Vitas T., to Tomco, Inc. Pressure compensating valve spool assembly for a hydraulic control valve. 3,985,153, Cl. 137-596.000.
Thompson, Arnold R.: *See—*
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Thompson, Jerome C. Marine organism rearing system. 3,985,101, Cl. 119-2.000.
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Throckmorton, Morford C.; and Sandstrom, Paul H., to Goodyear Tire & Rubber Company, The. Preparation of polymerization catalyst and polymerization therewith. 3,985,677, Cl. 252-429.00B.
Thunberg, Jon Carl; Bragdon, Robert Wright; and Moore, William Philip, to W. R. Grace & Co. Process for recovering glycine from sodium chloride solutions. 3,985,801, Cl. 260-534.00R.
Thyen, Eberhard; and Komarnycky, Peter, to Ethicon, Inc. Package for armed sutures. 3,985,227, Cl. 206-63.300.
Tijsma, Sjoerd; and Spenkelink, Gerrit Johan Hendrik, to Hollandse Signaalapparaten B.V. Stabilization system for a platform suspended in a gimbal frame. 3,986,092, Cl. 318-649.000.
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Timte, Frank: *See—*
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Tindall, David, to Spectus Oil Burner, Ltd. Multi fluid injectors. 3,985,301, Cl. 239-126.000.
Tirro, Sebastiano; Cafissi, Roberto; and Cavalieri d'Oro, Enzo, to Telespazio S.p.A. per le Comunicazioni Spaziali; GTE Telecomunicazioni S.p.A.; and Societa Italiana Telecomunicazioni Siemens S.p.A. System for the automatic correction of polarization distortion in multichannel radiocommunication station. 3,986,123, Cl. 325-56.000.
Tixier, Michel, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Vehicle speed-limiting system. 3,985,195, Cl. 180-98.000.
Toaseiko Co., Ltd.: *See—*
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Tobias, Michael A.; and Lamanna, Richard A., to Mobil Oil Corporation. Water reducible epoxy ester coating composition. 3,985,695, Cl. 260-29.2EP.
Tokuda, Kazuo, to Nippon Electric Company, Ltd. Circuit for transforming a trigger signal into a pulse. 3,986,056, Cl. 307-273.000.
Tokyo Keiki Co., Ltd.: *See—*
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Tollrian, Herwig; and Weinfurtner, Gunter, to Tekade Felten & Guilleaume Fernmeldeanlagen GmbH. Devices for limiting the output voltage of current-controlled remote feed apparatuses. 3,986,078, Cl. 317-16.000.
Tomaides, Milos, to Chemtool, Inc. Electrostatic air cleaner. 3,985,525, Cl. 55-138.000.
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Toratani, Takehiko, to Alps Motorola, Inc. Fly-wheel for tape recorder. 3,985,043, Cl. 74-572.000.
Toray Industries, Inc.: *See—*
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Torn, William R., to DuKane Corporation. Sound masking system for open plan office. 3,985,957, Cl. 179-1.50M.
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Torres, Jose Marcelo; and Musick, Charles Ronald, to Combustion Engineering, Inc. Reactor trip on turbine trip inhibit control system for nuclear power generating system. 3,985,613, Cl. 176-20.00R.
Townsend, Franklin L.; and Trumpio, Frank P., to Barber-Colman Company. Heddle transfer apparatus and method for triaxial weaving machine. 3,985,159, Cl. 139-11.000.
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Trebinger, Karl: *See—*
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Tsao, Utah, to Lummus Company, The. Separation of 1,1-dichloroethane from 1,2-dichloroethane. 3,985,816, Cl. 260-652.00P.
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Tuttle, Bertha S.; and Ozolins, Jekabs, to J. N. Tuttle, Inc. Process for treating aluminum with ferricyanide compound. 3,985,585, Cl. 148-6.270.
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Walker, Robert, to Bristol Screw Products Corporation. Non-refillable safety valve. 3,985,332, Cl. 251-111.000.

Wallace, Robert Lee, Jr., to Bell Telephone Laboratories, Incorporated. Stereophonic sound reproduction with acoustically matched receiver units effecting flat frequency response at a listener's eardrums. 3,985,960, Cl. 179-1.00G.

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Weisberg, Alex. Method of making a combined heel positioner and arch support for the foot. 3,985,853, Cl. 264-250.000.

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Widegren, John Gunnar. Golf bag with collapsible cart. 3,985,373, Cl. 280-652.000.

Wideman, Ronald H., to Poly-Wide, Inc. Method of and means for treating burn victims. 3,985,130, Cl. 128-132.00R.

Widner, Rayburn K., to United States of America, Army. High "G" gyro with fluidic exhaust control for fluidic bearing. 3,985,034, Cl. 74-5.700.

Wiesenhutter, Annelise Klara Helene, heiress: *See—*
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Wise, Joseph, to United States of America, Air Force. Integral heater thermal energy storage device. 3,984,980, Cl. 60-517.000.

Wisseman, Leo L.; and Bryan, Anthony G., to Motorola, Inc. Communication switching system. 3,986,174, Cl. 340-173.00R.

Witherspoon, Romeo Richard; and Adams, Richard Leighton, to General Motors Corporation. Tailored-carbon substrate for fuel cell electrodes. 3,985,578, Cl. 429-44.000.

Wittkopp, Fritz; and Wenzek, Gerhard, to Siemens Aktiengesellschaft. X-ray examination apparatus. 3,986,034, Cl. 250-468.000.

Wittlinger, Harold Allen, to RCA Corporation. Series energized transistor amplifier. 3,986,132, Cl. 330-18.000.
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Adler, Robert, 3,985,952.
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B 24,017	3,914,140	Oct. 21, 1975	B 288,018	3,925,239	Dec. 9, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 288,627	3,916,179	Oct. 28, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 288,638	3,925,132	Dec. 9, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 289,175	3,924,309	Dec. 9, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 289,471	3,917,184	Nov. 4, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 289,523	3,921,166	Nov. 18, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 289,883	3,925,063	Dec. 9, 1975
B 178,475	3,944,602	Mar. 16, 1976	B 290,328	3,924,838	Dec. 9, 1975
B 189,772	3,925,367	Dec. 9, 1975	B 291,104	3,925,007	Dec. 9, 1975
B 189,773	3,925,405	Dec. 9, 1975	B 291,694	3,925,339	Dec. 9, 1975
B 190,679	3,925,346	Dec. 9, 1975	B 292,054	3,915,877	Oct. 28, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 292,126	3,914,465	Oct. 21, 1975
B 204,161	3,924,605	Dec. 9, 1975	B 292,140	3,914,340	Oct. 21, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 292,300	3,927,167	Dec. 16, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 292,563	3,923,653	Dec. 2, 1975
B 213,211	3,925,269	Dec. 9, 1975	B 293,378	3,923,725	Dec. 2, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 293,437	3,913,414	Oct. 21, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 294,103	3,924,396	Dec. 9, 1975
B 223,621	3,925,526	Dec. 9, 1975	B 294,579	3,916,737	Nov. 4, 1975
B 224,323	3,925,476	Dec. 9, 1975	B 294,673	3,916,023	Oct. 28, 1975
B 233,383	3,925,424	Dec. 9, 1975	B 295,481	3,921,593	Nov. 25, 1975
B 233,741	3,925,326	Dec. 9, 1975	B 295,674	3,916,107	Oct. 28, 1975
B 235,011	3,925,086	Dec. 9, 1975	B 295,860	3,923,880	Dec. 2, 1975
B 235,925	3,924,949	Dec. 9, 1975	B 299,267	3,917,106	Nov. 4, 1975
B 236,609	3,925,187	Dec. 9, 1975	B 300,353	3,921,734	Nov. 25, 1975
B 237,953	3,924,051	Dec. 2, 1975	B 302,271	3,929,130	Dec. 30, 1975
B 239,289	3,922,711	Nov. 25, 1975	B 302,692	3,924,598	Dec. 9, 1975
B 241,433	3,923,711	Dec. 2, 1975	B 302,836	3,923,573	Dec. 2, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 302,998	3,928,233	Dec. 23, 1975
B 248,916	3,920,862	Nov. 18, 1975	B 303,011	3,930,188	Dec. 30, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 303,655	3,924,642	Dec. 9, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 303,702	3,914,131	Oct. 21, 1975
B 252,947	3,923,803	Dec. 2, 1975	B 304,687	3,924,783	Dec. 9, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 305,417	3,915,882	Oct. 28, 1975
B 254,708	3,923,878	Dec. 2, 1975	B 305,868	3,921,463	Nov. 25, 1975
B 255,756	3,923,781	Dec. 2, 1975	B 305,881	3,923,478	Dec. 2, 1975
B 256,334	3,924,988	Dec. 9, 1975	B 306,829	3,925,411	Dec. 9, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 306,938	3,916,050	Oct. 28, 1975
B 258,687	3,914,221	Oct. 21, 1975	B 307,677	3,915,276	Oct. 28, 1975
B 259,236	3,924,874	Dec. 9, 1975	B 308,661	3,924,349	Dec. 9, 1975
B 259,274	3,928,688	Dec. 23, 1975	B 308,892	3,919,624	Nov. 11, 1975
B 260,455	3,925,634	Dec. 9, 1975	B 309,207	3,914,743	Oct. 21, 1975
B 260,945	3,925,250	Dec. 9, 1975	B 309,499	3,922,002	Nov. 25, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 309,681	3,927,374	Dec. 16, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 309,755	3,919,468	Nov. 11, 1975
B 262,241	3,925,528	Dec. 9, 1975	B 309,756	3,914,136	Oct. 21, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 309,860	3,922,485	Nov. 25, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 264,257	3,928,665	Dec. 23, 1975	B 310,271	3,923,689	Dec. 2, 1975
B 264,833	3,923,566	Dec. 2, 1975	B 310,740	3,985,686	Oct. 12, 1976
B 265,369	3,925,245	Dec. 9, 1975	B 311,313	3,925,142	Dec. 9, 1975
B 265,727	3,914,479	Oct. 21, 1975	B 311,317	3,918,975	Nov. 11, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 311,413	3,925,515	Dec. 9, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 311,910	3,924,357	Dec. 9, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 311,911	3,925,233	Dec. 9, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 312,139	3,925,530	Dec. 9, 1975
B 271,104	3,925,400	Dec. 9, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 313,098	3,925,045	Dec. 9, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 313,594	3,924,626	Dec. 9, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 313,900	3,915,932	Oct. 28, 1975
B 276,993	3,948,823	Apr. 6, 1976	B 314,049	3,920,588	Nov. 18, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 314,255	3,923,764	Dec. 2, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 314,271	3,921,845	Nov. 25, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 314,489	3,925,016	Dec. 9, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 314,800	3,930,087	Dec. 30, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 315,363	3,920,673	Nov. 18, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 315,397	3,923,963	Dec. 2, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 315,731	3,914,108	Oct. 21, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 316,014	3,920,861	Nov. 18, 1975
B 282,252	3,924,997	Dec. 9, 1975	B 316,239	3,913,546	Oct. 21, 1975
B 282,819	3,982,932	Sep. 28, 1976	B 316,917	3,925,494	Dec. 9, 1975
B 283,124	3,923,512	Dec. 2, 1975	B 317,080	3,925,324	Dec. 9, 1975
B 283,300	3,925,011	Dec. 9, 1975	B 317,347	3,923,552	Dec. 2, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 317,624	3,925,167	Dec. 9, 1975
B 284,427	3,952,812	Apr. 27, 1976	B 318,195	3,915,699	Oct. 28, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 318,618	3,915,365	Oct. 28, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 318,640	3,925,186	Dec. 9, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 319,226	3,925,082	Dec. 9, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 319,339	3,916,056	Oct. 28, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 319,402	3,919,568	Nov. 11, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 319,414	3,928,666	Dec. 23, 1975
B 287,275	3,925,141	Dec. 9, 1975	B 320,261	3,924,033	Dec. 2, 1975
B 287,373	3,918,568	Nov. 11, 1975	B 320,452	3,925,083	Dec. 9, 1975

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B 320,603	3,915,571	Oct. 28, 1975
B 321,018	3,921,623	Nov. 25, 1975
B 321,101	3,917,163	Nov. 4, 1975
B 321,938	3,923,889	Dec. 2, 1975
B 322,182	3,925,390	Dec. 9, 1975
B 322,239	3,920,973	Nov. 18, 1975
B 322,564	3,914,373	Oct. 21, 1975
B 322,611	3,920,863	Nov. 18, 1975
B 322,777	3,924,382	Dec. 9, 1975
B 323,127	3,923,967	Dec. 2, 1975
B 323,191	3,914,566	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975
B 323,568	3,920,536	Nov. 18, 1975
B 323,666	3,924,568	Dec. 9, 1975
B 324,495	3,928,664	Dec. 23, 1975
B 324,503	3,928,524	Dec. 23, 1975
B 324,505	3,925,294	Dec. 9, 1975
B 324,739	3,924,990	Dec. 9, 1975
B 324,879	3,923,538	Dec. 2, 1975
B 325,102	3,924,355	Dec. 9, 1975
B 325,262	3,921,304	Nov. 25, 1975
B 326,514	3,925,080	Dec. 9, 1975
B 327,109	3,925,350	Dec. 9, 1975
B 327,363	3,923,504	Dec. 2, 1975
B 327,612	3,925,620	Dec. 9, 1975
B 327,674	3,918,540	Nov. 11, 1975
B 327,899	3,925,674	Dec. 9, 1975
B 328,164	3,914,703	Oct. 21, 1975
B 328,200	3,916,031	Oct. 28, 1975
B 328,205	3,914,106	Oct. 21, 1975
B 328,210	3,914,275	Oct. 21, 1975
B 328,870	3,916,486	Nov. 4, 1975
B 329,115	3,924,727	Dec. 9, 1975
B 329,476	3,920,562	Nov. 18, 1975
B 329,612	3,925,128	Dec. 9, 1975
B 329,787	3,920,688	Nov. 18, 1975
B 329,816	3,923,947	Dec. 2, 1975
B 330,536	3,925,452	Dec. 9, 1975
B 330,828	3,913,589	Oct. 21, 1975
B 331,417	3,914,157	Oct. 21, 1975
B 331,557	3,916,577	Nov. 4, 1975
B 331,895	3,916,403	Oct. 28, 1975
B 332,527	3,924,017	Dec. 2, 1975
B 332,811	3,924,359	Dec. 9, 1975
B 333,876	3,921,208	Nov. 18, 1975
B 333,928	3,927,172	Dec. 16, 1975
B 334,251	3,924,719	Dec. 9, 1975
B 334,868	3,919,469	Nov. 11, 1975
B 334,985	3,923,912	Dec. 2, 1975
B 335,670	3,928,686	Dec. 23, 1975
B 335,741	3,925,615	Dec. 9, 1975
B 335,773	3,920,953	Nov. 18, 1975
B 336,129	3,923,606	Dec. 2, 1975
B 336,243	3,925,422	Dec. 9, 1975
B 336,345	3,925,179	Dec. 9, 1975
B 336,652	3,914,211	Oct. 21, 1975
B 336,902	3,918,897	Nov. 11, 1975
B 336,946	3,919,425	Nov. 11, 1975
B 336,978	3,923,968	Dec. 2, 1975
B 337,235	3,919,386	Nov. 11, 1975
B 337,409	3,925,258	Dec. 9, 1975
B 337,442	3,913,658	Oct. 21, 1975
B 337,703	3,914,690	Oct. 21, 1975
B 337,787	3,923,506	Dec. 2, 1975
B 339,057	3,924,822	Dec. 9, 1975
B 339,218	3,925,121	Dec. 9, 1975
B 339,699	3,933,527	Jan. 20, 1976
B 339,838	3,930,221	Dec. 30, 1975
B 340,212	3,922,645	Nov. 25, 1975
B 340,833	3,925,208	Dec. 9, 1975
B 341,579	3,913,363	Oct. 21, 1975
B 342,084	3,928,694	Dec. 23, 1975
B 342,423	3,925,334	Dec. 9, 1975
B 342,886	3,923,507	Dec. 2, 1975
B 343,136	3,919,453	Nov. 11, 1975
B 343,240	3,925,693	Dec. 9, 1975
B 343,506	3,916,021	Oct. 28, 1975
B 343,577	3,921,165	Nov. 18, 1975
B 344,203	3,928,719	Dec. 23, 1975
B 344,479	3,924,042	Dec. 2, 1975
B 345,060	3,916,018	Oct. 28, 1975
B 345,384	3,916,146	Oct. 28, 1975
B 345,390	3,940,343	Feb. 24, 1976
B 345,422	3,914,392	Oct. 21, 1975
B 345,527	3,927,365	Dec. 16, 1975
B 345,567	3,913,985	Oct. 21, 1975
B 346,165	3,913,293	Oct. 21, 1975
B 346,210	3,916,142	Oct. 28, 1975
B 346,350	3,915,824	Oct. 28, 1975
B 346,487	3,927,406	Dec. 16, 1975
B 346,585	3,913,820	Oct. 21, 1975
B 346,613	3,923,545	Dec. 2, 1975
B 346,901	3,915,583	Oct. 28, 1975
B 348,083	3,923,774	Dec. 2, 1975
B 348,383	3,923,452	Dec. 2, 1975
B 348,495	3,914,654	Oct. 21, 1975
B 348,558	3,914,109	Oct. 21, 1975
B 349,141	3,915,363	Oct. 28, 1975
B 349,177	3,914,033	Oct. 21, 1975
B 349,231	3,915,831	Oct. 28, 1975
B 349,321	3,916,103	Oct. 28, 1975
B 349,948	3,914,557	Oct. 21, 1975
B 350,025	3,927,415	Dec. 16, 1975
B 350,143	3,924,419	Dec. 9, 1975
B 350,219	3,917,802	Nov. 4, 1975
B 350,245	3,914,331	Oct. 21, 1975
B 350,523	3,924,726	Dec. 9, 1975
B 350,589	3,927,419	Dec. 16, 1975
B 350,708	3,923,871	Dec. 2, 1975
B 350,843	3,915,461	Oct. 28, 1975
B 351,055	3,914,074	Oct. 21, 1975
B 351,218	3,914,186	Oct. 21, 1975
B 351,222	3,921,179	Nov. 18, 1975
B 351,348	3,923,563	Dec. 2, 1975
B 351,421	3,914,733	Oct. 21, 1975
B 351,493	3,914,758	Oct. 21, 1975
B 351,535	3,915,239	Oct. 28, 1975
B 351,665	3,919,701	Nov. 11, 1975
B 351,672	3,914,000	Oct. 21, 1975
B 351,735	3,913,385	Oct. 21, 1975
B 351,863	3,914,700	Oct. 21, 1975
B 351,883	3,924,657	Dec. 9, 1975
B 351,926	3,914,133	Oct. 21, 1975
B 351,939	3,913,480	Oct. 21, 1975
B 352,445	3,928,746	Dec. 23, 1975
B 352,934	3,913,692	Oct. 21, 1975
B 352,950	3,922,590	Nov. 25, 1975
B 352,965	3,921,926	Nov. 25, 1975
B 353,317	3,916,446	Nov. 4, 1975
B 353,387	3,924,404	Dec. 9, 1975
B 353,546	3,913,273	Oct. 21, 1975
B 354,008	3,925,081	Dec. 9, 1975
B 354,098	3,925,547	Dec. 9, 1975
B 354,145	3,927,279	Dec. 16, 1975
B 354,296	3,914,580	Oct. 21, 1975
B 354,510	3,928,658	Dec. 23, 1975
B 354,889	3,913,204	Oct. 21, 1975
B 354,979	3,914,251	Oct. 21, 1975
B 355,095	3,925,656	Dec. 9, 1975
B 355,269	3,914,561	Oct. 21, 1975
B 355,510	3,913,704	Oct. 21, 1975
B 355,595	3,925,649	Dec. 9, 1975
B 355,876	3,925,685	Dec. 9, 1975
B 356,032	3,928,636	Dec. 23, 1975
B 356,253	3,925,025	Dec. 9, 1975
B 356,602	3,927,393	Dec. 16, 1975
B 356,724	3,924,586	Dec. 9, 1975
B 357,039	3,924,406	Dec. 9, 1975
B 357,057	3,913,738	Oct. 21, 1975
B 357,131	3,924,453	Dec. 9, 1975
B 357,402	3,914,180	Oct. 21, 1975
B 357,682	3,924,973	Dec. 9, 1975
B 357,803	3,919,470	Nov. 11, 1975
B 358,174	3,924,958	Dec. 9, 1975
B 358,244	3,913,411	Oct. 21, 1975
B 358,311	3,923,561	Dec. 2, 1975
B 358,939	3,924,713	Dec. 9, 1975
B 359,174	3,914,117	Oct. 21, 1975
B 359,187	3,924,525	Dec. 9, 1975
B 359,540	3,915,235	Oct. 28, 1975
B 359,740	3,936,212	Feb. 3, 1976
B 359,791	3,929,430	Dec. 30, 1975
B 359,825	3,921,344	Nov. 25, 1975
B 359,946	3,914,132	Oct. 21, 1975
B 359,947	3,914,653	Oct. 21, 1975
B 360,208	3,923,750	Dec. 2, 1975
B 360,296	3,916,720	Nov. 4, 1975
B 360,719	3,915,715	Oct. 28, 1975
B 360,910	3,925,696	Dec. 9, 1975
B 361,265	3,923,569	Dec. 2, 1975
B 361,443	3,927,405	Dec. 16, 1975
B 361,569	3,914,554	Oct. 21, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 361,604	3,922,702	Nov. 25, 1975
B 361,734	3,915,764	Oct. 28, 1975
B 362,589	3,914,012	Oct. 21, 1975
B 363,205	3,923,744	Dec. 2, 1975
B 363,337	3,928,639	Dec. 23, 1975
B 363,457	3,922,595	Nov. 25, 1975
B 363,674	3,929,716	Dec. 30, 1975
B 363,892	3,913,395	Oct. 21, 1975
B 363,962	3,921,826	Nov. 25, 1975
B 364,022	3,913,499	Oct. 21, 1975
B 364,163	3,916,092	Oct. 28, 1975
B 364,241	3,916,668	Nov. 4, 1975
B 364,334	3,924,670	Dec. 9, 1975
B 364,528	3,919,510	Nov. 11, 1975
B 364,786	3,921,673	Nov. 25, 1975
B 364,910	3,925,335	Dec. 9, 1975
B 365,490	3,918,527	Nov. 11, 1975
B 365,834	3,914,702	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975
B 365,855	3,917,258	Nov. 4, 1975
B 366,287	3,924,946	Dec. 9, 1975
B 366,402	3,928,053	Dec. 23, 1975
B 366,589	3,914,719	Oct. 21, 1975
B 367,021	3,914,752	Oct. 21, 1975
B 367,040	3,924,775	Dec. 9, 1975
B 367,661	3,914,158	Oct. 21, 1975
B 367,739	3,923,648	Dec. 2, 1975
B 367,812	3,924,789	Dec. 9, 1975
B 368,081	3,924,691	Dec. 9, 1975
B 368,387	3,924,923	Dec. 9, 1975
B 368,392	3,913,812	Oct. 21, 1975
B 368,397	3,914,677	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975
B 369,563	3,924,449	Dec. 9, 1975
B 369,607	3,923,786	Dec. 2, 1975
B 369,997	3,913,533	Oct. 21, 1975
B 370,453	3,964,101	Jun. 15, 1976
B 370,706	3,925,242	Dec. 9, 1975
B 371,073	3,930,135	Dec. 30, 1975
B 371,085	3,923,783	Dec. 2, 1975
B 371,787	3,921,217	Nov. 18, 1975
B 371,805	3,914,433	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975
B 372,823	3,924,660	Dec. 9, 1975
B 373,297	3,924,436	Dec. 9, 1975
B 373,326	3,920,433	Nov. 18, 1975
B 373,428	3,915,511	Oct. 28, 1975
B 375,220	3,920,417	Nov. 18, 1975
B 375,652	3,921,303	Nov. 25, 1975
B 376,504	3,914,570	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975
B 376,742	3,924,392	Dec. 9, 1975
B 376,799	3,913,955	Oct. 21, 1975
B 377,172	3,918,255	Nov. 11, 1975
B 377,683	3,924,433	Dec. 9, 1975
B 377,833	3,913,884	Oct. 21, 1975
B 377,869	3,917,002	Nov. 4, 1975
B 378,621	3,923,840	Dec. 2, 1975
B 379,038	3,923,994	Dec. 2, 1975
B 379,172	3,914,379	Oct. 21, 1975
B 379,282	3,913,462	Oct. 21, 1975
B 379,955	3,913,157	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1975
B 380,141	3,925,161	Dec. 9, 1975
B 380,310	3,921,048	Nov. 18, 1975
B 380,312	3,913,953	Oct. 21, 1975
B 380,338	3,924,873	Dec. 9, 1975
B 380,446	3,923,836	Dec. 2, 1975
B 380,900	3,913,307	Oct. 21, 1975
B 380,926	3,925,095	Dec. 9, 1975
B 381,074	3,919,583	Nov. 11, 1975
B 381,632	3,914,732	Oct. 21, 1975
B 381,847	3,921,152	Nov. 18, 1975
B 382,018	3,929,742	Dec. 30, 1975
B 382,021	3,913,212	Oct. 21, 1975
B 382,261	3,914,991	Oct. 28, 1975
B 382,290	3,924,717	Dec. 9, 1975
B 382,783	3,919,527	Nov. 11, 1975
B 382,798	3,924,435	Dec. 9, 1975
B 382,840	3,922,007	Nov. 25, 1975
B 383,465	3,927,412	Dec. 16, 1975
B 383,532	3,914,246	Oct. 21, 1975
B 383,581	3,925,318	Dec. 9, 1975
B 384,499	3,925,135	Dec. 9, 1975
B 384,658	3,913,452	Oct. 21, 1975
B 384,773	3,915,416	Oct. 28, 1975
B 385,210	3,913,406	Oct. 21, 1975
B 386,403	3,924,895	Dec. 9, 1975
B 386,592	3,925,305	Dec. 9, 1975
B 387,039	3,924,510	Dec. 9, 1975
B 387,331	3,913,701	Oct. 21, 1975
B 387,363	3,927,378	Dec. 16, 1975
B 387,687	3,918,151	Nov. 11, 1975
B 387,761	3,914,245	Oct. 21, 1975
B 387,790	3,925,380	Dec. 9, 1975
B 387,818	3,918,935	Nov. 11, 1975
B 388,580	3,923,712	Dec. 2, 1975
B 389,070	3,914,171	Oct. 21, 1975
B 389,285	3,914,631	Oct. 21, 1975
B 389,327	3,924,504	Dec. 9, 1975
B 389,639	3,914,626	Oct. 21, 1975
B 389,726	3,921,010	Nov. 18, 1975
B 389,807	3,922,623	Nov. 25, 1975
B 389,932	3,913,268	Oct. 21, 1975
B 389,933	3,913,267	Oct. 21, 1975
B 390,679	3,913,668	Oct. 21, 1975
B 390,732	3,913,878	Oct. 21, 1975
B 391,184	3,914,214	Oct. 21, 1975
B 391,210	3,914,220	Oct. 21, 1975
B 391,437	3,915,416	Oct. 28, 1975
B 391,509	3,925,175	Dec. 9, 1975
B 391,675	3,916,017	Oct. 28, 1975
B 392,154	3,923,809	Dec. 2, 1975
B 392,242	3,926,636	Dec. 16, 1975
B 392,696	3,916,175	Oct. 28, 1975
B 392,732	3,914,903	Oct. 21, 1975
B 392,753	3,916,341	Oct. 28, 1975
B 392,894	3,914,763	Oct. 21, 1975
B 393,163	3,914,535	Oct. 21, 1975
B 393,347	3,985,800	Oct. 12, 1976
B 393,970	3,914,638	Oct. 21, 1975
B 394,088	3,914,740	Oct. 21, 1975
B 394,188	3,924,591	Dec. 9, 1975
B 394,300	3,914,159	Oct. 21, 1975
B 394,712	3,916,306	Oct. 28, 1975
B 395,478	3,922,577	Nov. 25, 1975
B 395,496	3,919,435	Nov. 11, 1975
B 395,671	3,920,418	Nov. 18, 1975
B 395,889	3,913,190	Oct. 21, 1975
B 396,025	3,913,869	Oct. 21, 1975
B 396,551	3,921,929	Nov. 25, 1975
B 397,027	3,923,736	Dec. 2, 1975
B 397,527	3,913,488	Oct. 21, 1975
B 397,990	3,914,848	Oct. 28, 1975
B 398,262	3,913,481	Oct. 21, 1975
B 398,551	3,924,924	Dec. 9, 1975
B 398,597	3,913,743	Oct. 21, 1975
B 398,625	3,920,996	Nov. 18, 1975
B 399,292	3,914,810	Oct. 28, 1975
B 399,304	3,919,567	Nov. 11, 1975
B 399,349	3,925,694	Dec. 9, 1975
B 399,766	3,915,667	Oct. 28, 1975
B 400,080	3,925,163	Dec. 9, 1975
B 400,293	3,923,719	Dec. 2, 1975
B 400,310	3,915,507	Oct. 28, 1975
B 401,133	3,924,443	Dec. 9, 1975
B 401,992	3,924,898	Dec. 9, 1975
B 402,065	3,925,413	Dec. 9, 1975
B 402,555	3,914,688	Oct. 21, 1975
B 403,140	3,913,486	Oct. 21, 1975
B 403,355	3,913,352	Oct. 21, 1975
B 403,990	3,914,684	Oct. 21, 1975
B 403,996	3,916,016	Oct. 28, 1975
B 404,290	3,924,918	Dec. 9, 1975
B 404,437	3,915,200	Oct. 28, 1975
B 405,136	3,915,565	Oct. 28, 1975
B 405,137	3,915,566	Oct. 28, 1975
B 405,160	3,924,821	Dec. 9, 1975
B 405,248	3,926,294	Dec. 16, 1975
B 405,305	3,922,111	Nov. 25, 1975
B 405,360	3,913,403	Oct. 21, 1975
B 405,495	3,924,577	Dec. 9, 1975
B 405,938	3,920,109	Nov. 18, 1975
B 406,065	3,914,199	Oct. 21, 1975
B 406,357	3,924,529	Dec. 9, 1975
B 406,800	3,952,708	Apr. 27, 1976
B 407,736	3,924,463	Dec. 9, 1975
B 407,357	3,924,614	Dec. 9, 1975
B 407,728	3,925,240	Dec. 9, 1975
B 408,380	3,984,172	Oct. 5, 1976
B 408,487	3,924,046	Dec. 2, 1975
B 408,749	3,914,116	Oct. 21, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 409,026	3,925,497	Dec. 9, 1975
B 409,220	3,915,648	Oct. 28, 1975
B 409,251	3,922,620	Nov. 25, 1975
B 409,657	3,927,362	Dec. 16, 1975
B 409,816	3,921,317	Nov. 25, 1975
B 410,062	3,923,855	Dec. 2, 1975
B 410,168	3,914,717	Oct. 21, 1975
B 411,145	3,914,168	Oct. 21, 1975
B 411,356	3,919,649	Nov. 11, 1975
B 411,483	3,925,196	Dec. 9, 1975
B 411,633	3,914,741	Oct. 21, 1975
B 412,516	3,927,417	Dec. 16, 1975
B 412,619	3,925,292	Dec. 9, 1975
B 412,867	3,924,587	Dec. 9, 1975
B 413,006	3,914,850	Oct. 28, 1975
B 413,546	3,924,314	Dec. 9, 1975
B 414,129	3,925,484	Dec. 9, 1975
B 414,288	3,925,537	Dec. 9, 1975
B 415,113	3,915,717	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975
B 415,845	3,925,076	Dec. 9, 1975
B 415,847	3,914,208	Oct. 21, 1975
B 415,957	3,925,635	Dec. 9, 1975
B 415,977	3,927,359	Dec. 16, 1975
B 416,598	3,923,473	Dec. 2, 1975
B 416,832	3,924,975	Dec. 9, 1975
B 416,710	3,923,746	Dec. 2, 1975
B 416,933	3,924,968	Dec. 9, 1975
B 417,299	3,918,235	Nov. 11, 1975
B 418,121	3,925,023	Dec. 9, 1975
B 418,153	3,925,251	Dec. 9, 1975
B 418,302	3,913,252	Oct. 21, 1975
B 419,327	3,921,197	Nov. 18, 1975
B 419,481	3,924,970	Dec. 9, 1975
B 420,016	3,914,572	Oct. 21, 1975
B 420,148	3,927,414	Dec. 16, 1975
B 420,514	3,923,929	Dec. 2, 1975
B 420,568	3,925,069	Dec. 9, 1975
B 421,026	3,914,785	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975
B 421,383	3,925,047	Dec. 9, 1975
B 421,797	3,914,023	Oct. 21, 1975
B 422,399	3,928,656	Dec. 23, 1975
B 422,467	3,924,804	Dec. 9, 1975
B 422,949	3,921,873	Nov. 25, 1975
B 424,415	3,919,458	Nov. 11, 1975
B 424,462	3,920,522	Nov. 18, 1975
B 424,572	3,924,979	Dec. 9, 1975
B 424,748	3,924,395	Dec. 9, 1975
B 425,035	3,914,025	Oct. 21, 1975
B 425,345	3,922,015	Nov. 25, 1975
B 425,470	3,923,796	Dec. 2, 1975
B 425,539	3,916,742	Nov. 4, 1975
B 425,541	3,914,051	Oct. 21, 1975
B 425,572	3,923,822	Dec. 2, 1975
B 427,631	3,921,433	Nov. 25, 1975
B 428,177	3,914,624	Oct. 21, 1975
B 428,795	3,921,056	Nov. 18, 1975
B 429,442	3,923,485	Dec. 2, 1975
B 430,106	3,918,941	Nov. 11, 1975
B 430,140	3,922,084	Nov. 25, 1975
B 430,798	3,918,204	Nov. 11, 1975
B 430,944	3,922,096	Nov. 25, 1975
B 432,373	3,919,670	Nov. 11, 1975
B 433,587	3,914,567	Oct. 21, 1975
B 435,343	3,919,244	Nov. 11, 1975
B 435,844	3,925,170	Dec. 9, 1975
B 437,173	3,924,627	Dec. 9, 1975
B 437,172	3,913,251	Oct. 21, 1975
B 437,195	3,914,618	Oct. 21, 1975
B 437,450	3,922,479	Nov. 25, 1975
B 438,053	3,916,013	Oct. 28, 1975
B 438,706	3,925,050	Dec. 9, 1975
B 439,168	3,919,676	Nov. 11, 1975
B 439,669	3,921,499	Nov. 25, 1975
B 440,898	3,921,789	Nov. 25, 1975
B 441,024	3,913,629	Oct. 21, 1975
B 441,416	3,913,851	Oct. 21, 1975
B 442,280	3,914,054	Oct. 21, 1975
B 442,859	3,918,570	Nov. 11, 1975
B 442,919	3,925,483	Dec. 9, 1975
B 444,614	3,927,996	Dec. 23, 1975
B 445,471	3,914,711	Oct. 21, 1975
B 445,740	3,923,612	Dec. 2, 1975
B 448,571	3,924,760	Dec. 9, 1975
B 449,647	3,916,797	Nov. 4, 1975
B 450,499	3,920,526	Nov. 18, 1975
B 450,546	3,924,417	Dec. 9, 1975
B 450,927	3,913,844	Oct. 21, 1975
B 455,520	3,922,543	Nov. 25, 1975
B 455,775	3,914,356	Oct. 21, 1975
B 456,346	3,914,531	Oct. 21, 1975
B 459,425	3,928,773	Dec. 23, 1975
B 461,872	3,919,586	Nov. 11, 1975
B 467,684	3,915,119	Oct. 28, 1975
B 468,198	3,925,340	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 533,056	3,983,969	Jan. 13,1976	Oct. 5, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF OCTOBER, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

C. G. Conn, Ltd.: *See*—
Southard, James S., Re. 28,999.

Cupples, Barrett L.; Lynch, Thomas J.; and Murphy, Clarence R., to Gulf Research & Development Company. Deactivating and removing aluminum and titanium contaminant from Ziegler-Natta polymerization mixtures. Re. 29,004, Cl. 528-485.000.

Foote, Milton. Cigarette snuffing device for vehicles. Re. 29,001, Cl. 131-256.000.

Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; by Vogler, Heinrich, heir at Law; by Vogler, Niklaus Eduard, heir at Law; and by Vogler, Franziska Elisabeth, heir at Law, to Hoffmann-La Roche Inc. (R)-1-(2-furoyloxy)-3-methylbutyl-penicillin. Re. 29,003, Cl. 260-239.100.

Govang, James A., to Stanley Works, The. Merchandising display assembly. Re. 29,002, Cl. 211-59.000.

Gulf Research & Development Company: *See*—
Cupples, Barrett L.; Lynch, Thomas J.; and Murphy, Clarence R., Re. 29,004.

Hoffmann-La Roche Inc.: *See*—
Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Heinrich, heir at Law; Vogler, Niklaus Eduard, heir at Law; and Vogler, Franziska Elisabeth, heir at Law, Re. 29,003.

Ifield, Richard J.; and Ifield, William R., to R. J. Ifield & Sons Pty. Limited. Hydraulic actuator. Re. 29,000, Cl. 91-174.000.

Ifield, William R.: *See*—
Ifield, Richard J.; and Ifield, William R., Re. 29,000.

Lanz, Paul: *See*—
Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Heinrich, heir at Law; Vogler, Niklaus Eduard, heir at Law; and Vogler, Franziska Elisabeth, heir at Law, Re. 29,003.

Lynch, Thomas J.: *See*—
Cupples, Barrett L.; Lynch, Thomas J.; and Murphy, Clarence R., Re. 29,004.

Murphy, Clarence R.: *See*—
Cupples, Barrett L.; Lynch, Thomas J.; and Murphy, Clarence R., Re. 29,004.

Quitt, Peter: *See*—
Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Heinrich, heir at Law; Vogler, Niklaus Eduard, heir at Law; and Vogler, Franziska Elisabeth, heir at Law, Re. 29,003.

R. J. Ifield & Sons Pty. Limited: *See*—
Ifield, Richard J.; and Ifield, William R., Re. 29,000.

Southard, James S., to C. G. Conn, Ltd. Automatic rhythm system providing drum break. Re. 28,999, Cl. 84-1.030.

Stanley Works, The: *See*—
Govang, James A., Re. 29,002.

Vogler, Franziska Elisabeth, heir at Law: *See*—
Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Heinrich, heir at Law; Vogler, Niklaus Eduard, heir at Law; and Vogler, Franziska Elisabeth, heir at Law, Re. 29,003.

Vogler, Heinrich, heir at Law: *See*—
Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Heinrich, heir at Law; Vogler, Niklaus Eduard, heir at Law; and Vogler, Franziska Elisabeth, heir at Law, Re. 29,003.

Vogler, Karl, deceased: *See*—
Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Heinrich, heir at Law; Vogler, Niklaus Eduard, heir at Law; and Vogler, Franziska Elisabeth, heir at Law, Re. 29,003.

Vogler, Niklaus Eduard, heir at Law: *See*—
Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Heinrich, heir at Law; Vogler, Niklaus Eduard, heir at Law; and Vogler, Franziska Elisabeth, heir at Law, Re. 29,003.

LIST OF PLANT PATENTEES

Armstrong Nurseries, Inc.: *See*—
Kordes, Reimer. 3,957.

Culbert, John R., to University of Illinois Foundation. Chrysanthemum plant. 3,955, 10–12–76, Cl. 81.

Illinois Foundation, University of: *See*—
Culbert, John R. 3,955.

Jackson & Perkins Co.: *See*—
Warriner, William A. 3,956.

Johnson, Ethan M.: *See*—
Johnson, Joseph H., Sr. 3,954.

Johnson, Joseph H., Sr., to Johnson, Ethan M., d.b.a. Johnson Cactus Gardens. Easter cactus. 3,954, 10–12–76, Cl. 88.

Kordes, Reimer, to Armstrong Nurseries, Inc. Rose plant. 3,957, 10–12–76, Cl. 11.

Solomone, Joseph. Grevillea plant aromas. 3,953, 10–12–76, Cl. 54.

Warriner, William A., to Jackson & Perkins Co. Rose plant. 3,956, 10–12–76, Cl. 11.

LIST OF DESIGN PATENTEES

AAI Corp.: *See*—
Sofinowsk, Jacob III, and Schnepfe. 241,837.

AMP Inc.: *See*—
Averitt, Marnie C. 241,823.
Wulf, Lavern D. 241,857.

Abbott Laboratories: *See*—
Gross, James R. 241,882.
Gross, James R. 241,884.

Alevras, Constantino J. Hair stylist's haircutting helmet. 241,886, 10–12–76, Cl. D86—10.

Allan, Jeffrey, Industries, Inc.: *See*—
Podall, Robert. 241,827.

Allibert Exploitation Societe Anonyme: *See*—
Vrignaud, Guy. 241,835.
Vrignaud, Guy. 241,858.

Allis-Chalmers Corp.: *See*—
Barthold, Robert G., and Diamant. 241,851.

American Dairy Queen Corp.: *See*—
Colato, Albert E. 241,801.

American Home Products Corp.: *See*—
King, Phillip W. 241,883.

Amerock Corp.: *See*—
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88 3,985,067

CLASS 96
1SD 3,985,559
1.5 3,985,560
29R 3,985,561
49 3,985,562
69 3,985,563
95 3,985,564
114.1 3,985,565
115R 3,985,566

CLASS 98
40D 3,985,068

CLASS 99
295 3,985,069
353 3,985,070
403 3,985,071

CLASS 100
255 3,985,072

CLASS 101
76 3,985,073
410 3,985,074

CLASS 102
8 3,985,075
39 3,985,076
56R 3,985,077
70.2P 3,985,080
70.2R 3,985,078
80 3,985,079

CLASS 104
23FS 3,985,081
89 3,985,082

CLASS 106
73.6 3,985,567
171 3,985,568
288Q 3,985,569
3,985,570
304 3,985,571

CLASS 108
111 3,985,083

CLASS 110
8C 3,985,085
8P 3,985,086
8R 3,985,084

CLASS 112
158R 3,985,087
178 3,985,088
266 3,985,089

CLASS 114
39 3,985,090
40 3,985,091
91 3,985,106
204 3,985,092
206R 3,985,093

CLASS 115
14 3,985,094

CLASS 116
124M 3,985,095

CLASS 118
58 3,985,096
425 3,985,097
637 3,985,098
3,985,099
643 3,985,100

CLASS 119
2 3,985,101
19 3,985,102
28 3,985,103
51.12 3,985,104
52B 3,985,105

CLASS 123
1A 3,985,107
3 3,985,108
8.09 3,985,109
8.47 3,985,110
122H 3,985,112
187.5R 3,985,113
197R 3,985,114
325T 3,985,111

CLASS 126
110AA 3,985,115
270 3,985,116
271 3,985,117
3,985,118
3,985,119
378 3,985,120

CLASS 128
2F 3,985,122
2K 3,985,121
2.05F 3,985,123
2.08 3,985,124
17 3,985,125
53 3,985,126
84R 3,985,127
90 3,985,128
91A 3,985,129
132R 3,985,130
145.8 3,985,131
146.2 3,985,132
214D 3,985,135
214F 3,985,133
214R 3,985,134
287 3,985,136
303.17 3,985,137
326 3,985,138
349B 3,985,139
350V 3,985,140
351 3,985,141
419PG 3,985,142

CLASS 131
4A 3,985,143
92 3,985,144
135 3,985,145
256 Re.29,001

CLASS 132
79B 3,985,146
89 3,985,147

CLASS 134
34 3,985,572

CLASS 135
66 3,985,148

CLASS 136
89 3,985,579

CLASS 137
1 3,985,149
240 3,985,150
269 3,985,151
360 3,985,152
596 3,985,153
625.29 3,985,154
625.48 3,985,155
637.2 3,985,156
801 3,985,157

CLASS 138
149 3,985,158

CLASS 139
11 3,985,159
93 3,985,160

CLASS 140
36 3,985,162
92.1 3,985,163
3,985,164

CLASS 141
21 3,985,165
346 3,985,166
392 3,985,167

CLASS 144
144.5GT 3,985,168
317 3,985,169

CLASS 145
50A 3,985,170

CLASS 148
3 3,985,582
6.16 3,985,583
3,985,584
6.27 3,985,585
23 3,985,586
3,985,587
103 3,985,588
160 3,985,589
175 3,985,590
187 3,985,591

CLASS 149
4 3,985,592
19.3 3,985,595
62 3,985,593
108.4 3,985,594

CLASS 150
52G 3,985,171

CLASS 151
41.73 3,985,172

CLASS 152
361FP 3,985,173

CLASS 156
6 3,985,596
11 3,985,597
54 3,985,598
164 3,985,599
229 3,985,600
3,985,601
235 3,985,602
3,985,603
244 3,985,604
384 3,985,605

CLASS 159
6WH 3,985,606
6W 3,985,607
48L 3,985,609

CLASS 160
180 3,985,174
229R 3,985,175

CLASS 162
133 3,985,610
157R 3,985,611
203 3,985,612

CLASS 164
45 3,985,176
51 3,985,177
237 3,985,178
250 3,985,179
332 3,985,180

CLASS 165
8 3,985,181
32 3,985,182

CLASS 172
53 3,985,184
81 3,985,185
3,985,186
224 3,985,187

CLASS 173
170 3,985,188

CLASS 174
28 3,985,948
70R 3,985,949
88C 3,985,950
138F 3,985,951

CLASS 175
52 3,985,189

CLASS 176
20R 3,985,613
87 3,985,614

CLASS 177
184 3,985,190
208 3,985,191

CLASS 178
6.6B 3,985,953
6.6R 3,985,952
7.3DC 3,985,954
69A 3,985,955

CLASS 179
1G 3,985,960
1.5A 3,985,956
1.5M 3,985,957
1.5R 3,985,958
2DP 3,985,959
15AF 3,985,961
15AL 3,985,962
15BC 3,985,968
15BD 3,985,963
15BS 3,985,967
15BT 3,985,964
15BY 3,985,965
3,985,966
15A 3,985,969
16EA 3,985,970
18AD 3,985,974
18BG 3,985,971
18DA 3,985,972
18ET 3,985,973
18GF 3,985,975
81B 3,985,976
82 3,985,977
100.4ST 3,985,978
156R 3,984,885
170.6 3,985,979
175.3R 3,985,980

CLASS 180
5R 3,985,192
82C 3,985,193
89A 3,985,194
98 3,985,195
103R 3,985,196
154 3,985,197

CLASS 181
33G 3,985,198
107 3,985,199
150 3,985,200
163 3,985,201

CLASS 182
79 3,985,202
120 3,985,203
223 3,985,204

CLASS 184
1E 3,985,205

CLASS 186
1R 3,985,206

CLASS 187
8.5 3,985,207

CLASS 188
1D 3,985,208
1R 3,985,209
170 3,985,210

CLASS 191
25 3,985,211

CLASS 192
12BA 3,985,212
56R 3,985,213
91A 3,985,214
98 3,985,215

CLASS 194
15 3,985,217

CLASS 195
1.3 3,985,615
63 3,985,616
68 3,985,617
103.5R 3,985,618
3,985,619
3,985,620
3,985,621
127 3,985,608
142 3,985,622

CLASS 196
132 3,985,623
3,985,624

CLASS 197
1R 3,985,216
54 3,985,218
151 3,985,219
177 3,985,220

CLASS 198
474 3,985,221
479 3,985,223
617 3,985,222
738 3,985,226
834 3,985,225
851 3,985,224

CLASS 200
25 3,985,981
33R 3,985,982
61.18 3,985,983
61.22 3,985,984
81.4 3,985,985
82D 3,985,986
148E 3,985,987
148R 3,985,988

CLASS 202
158 3,985,625
202 3,985,626
262 3,985,627

CLASS 204
14R 3,985,628
58 3,985,629
96 3,985,630
98 3,985,631
159.15 3,985,632
195P 3,985,633
212 3,985,634
298 3,985,635
301 3,985,636

CLASS 206
63.3 3,985,227
158 3,985,228
315R 3,985,229
424 3,985,230
448 3,985,231
461 3,985,232

CLASS 208
8 3,985,637
15 3,985,638
120 3,985,639
3,985,640
121 3,985,641
180 3,985,642
210 3,985,643
321 3,985,644

CLASS 209
10 3,985,645
104 3,985,233
214 3,985,646
218 3,985,647

CLASS 210
27 3,985,648
42S 3,985,649
44 3,985,650
54 3,985,651
97 3,985,652
150 3,985,653
232 3,985,654
321A 3,985,655
327 3,985,656
440 3,985,657

CLASS 211
7 3,985,183
59 Re.29,002

CLASS 212
144 3,985,234

CLASS 213
57 3,985,235
75R 3,985,236

CLASS 214
1BB 3,985,240
1BD 3,985,239
1CM 3,985,238
1H 3,985,237
6FS 3,985,241
10.5R 3,985,242
16.1A 3,985,243
17D 3,985,244
41R 3,985,245
82 3,985,246
140 3,985,247
141 3,985,248
145A 3,985,249
146R 3,985,250
152 3,985,251
302 3,985,252
506 3,985,253
515 3,985,254

CLASS 215
254 3,985,255

CLASS 217
26.5 3,985,256

CLASS 219
9.5 3,985,989
10.55D 3,985,993
10.55E 3,985,990
3,985,991
3,985,992
76 3,985,995
201 3,985,994
221 3,985,996
384 3,985,997

CLASS 220
1R 3,985,257
4F 3,985,258
86AT 3,985,259
203 3,985,260
270 3,985,261
349 3,985,262

CLASS 221
1 3,985,263
7 3,985,264
221 3,985,265

CLASS 222
22 3,985,266
70 3,985,267
108 3,985,268
145 3,985,269
168 3,985,270
190 3,985,271
205 3,985,272
326 3,985,273
362 3,985,274

CLASS 224
45S 3,985,275

CLASS 226
21 3,985,276
177 3,985,277

CLASS 227
86 3,985,278

CLASS 228
109 3,985,279
110 3,985,280
148 3,985,281
175 3,985,282
193 3,985,283

CLASS 229
3.5R 3,985,284
8 3,985,285
15 3,985,286
37R 3,985,287
38 3,985,288
44R 3,985,289
54R 3,985,290
3,985,291

CLASS 233
20A 3,985,292

CLASS 235
61.11E 3,985,999
3,986,000
3,986,001
61.12N 3,985,293
61.7B 3,985,998
78R 3,986,002
92EA 3,986,003
92EV 3,986,004
96 3,986,005
150.21 3,986,006
151.1 3,986,007
151.11 3,986,010
151.22 3,986,011
151.3 3,986,008
3,986,009
151.33 3,986,012
3,986,013
152 3,986,014
153BB 3,986,015
156 3,986,016

CLASS 236
15C 3,985,294
38 3,985,295
59 3,985,296

CLASS 239
15 3,985,297
54 3,985,298
119 3,985,299
3,985,300
126 3,985,301
185 3,985,161
424 3,985,302
428.5 3,985,303

CLASS 240
41R 3,986,017
47 3,986,018
147 3,986,019

CLASS 241
92 3,985,304
101.7 3,985,305
222 3,985,306
284 3,985,307
290 3,985,308
3,985,309

CLASS 242
4R 3,985,310
7.08 3,985,311
72R 3,985,312
78.1 3,985,313
107.4A 3,985,314
163 3,985,315

CLASS 243
19 3,985,316

CLASS 244
13 3,985,317
17.11 3,985,318
42DB 3,985,319
93 3,985,320
150 3,985,321

CLASS 248
5 3,985,322
188.9 3,985,323
223 3,985,324
3,985,325
226A 3,985,326
318 3,985,327
354H 3,985,328

CLASS 249
40 3,985,329
65 3,985,330

CLASS 250
199 3,986,020
203R 3,986,021
205 3,986,022
239 3,986,023
299 3,986,024
306 3,986,025
3,986,026
310 3,986,027
328 3,986,028
336 3,986,029
349 3,986,030
360 3,986,031
390 3,986,032
402 3,986,033
468 3,986,034
480 3,986,035
515 3,986,036
562 3,986,037

CLASS 251
77 3,985,331
111 3,985,332
129 3,985,333
159 3,985,334
176 3,985,335
205 3,985,336
324 3,985,337

CLASS 252
7 3,985,658
8.5A 3,985,659
3,985,667
12 3,985,660
3,985,661
41 3,985,662
62.1L 3,985,663
62.1R 3,985,664
3,985,665
63.2 3,985,666
99 3,985,668
116 3,985,669
117 3,985,670
180 3,985,671
182 3,985,672
3,985,673
188 3,985,674
317 3,985,675
428 3,985,676
429B 3,985,677
429R 3,985,678
430 3,985,679
456 3,985,680
462 3,985,681
463 3,985,682
466J 3,985,683
469 3,985,684
521 3,985,685
547 3,985,686
551 3,985,687

CLASS 254
131 3,985,338
137 3,985,339
150R 3,985,340
161 3,985,341
164 3,985,342

CLASS 256
47 3,985,343

CLASS 259
1R 3,985,344
8 3,985,345
72 3,985,346
108 3,985,347
191 3,985,348
3,985,349

CLASS 260
2.5AP 3,985,688
2.5R 3,985,689
6 3,985,690
13 3,985,691
22CB 3,985,692
23XA 3,985,693
28.5AS 3,985,694
29.2EP 3,985,695
29.4R 3,985,696
29.6TA 3,985,697
3,985,698
31.2N 3,985,699
33.6AQ 3,985,701
3,985,702
33.6R 3,985,700
42.29 3,985,703
42.32 3,985,704
45.75N 3,985,707
45.75W 3,985,706
45.8A 3,985,705
47UA 3,985,709
47R 3,985,708
48 3,985,710
75M 3,985,712
75N 3,985,711
77.5CR 3,985,713
78R 3,985,714
79.3R 3,985,716
79.5R 3,985,717
112R 3,985,722
112.5R 3,985,723
141 3,985,724
155 3,985,725
162 3,985,726
239D 3,985,729
3,985,730
239.1 Re.29,003
239.3B 3,985,731
239.3T 3,985,732
240G 3,985,733
242 3,985,734
243C 3,985,737
3,985,738
3,985,739
3,985,740
3,985,741
3,985,742
3,985,746
3,985,747
243R 3,985,735
3,985,736
246B 3,985,743
248NS 3,985,748
248C 3,985,744
249.5 3,985,745
256.4Q 3,985,749
268TR 3,985,750
283R 3,985,751
285.5 3,985,752
287P 3,985,753
294.8C 3,985,755
3,985,757
294.8D 3,985,754
294.8G 3,985,756
295.5R 3,985,758
296H 3,985,760
296R 3,985,759
302R 3,985,761
306 3,985,762
307D 3,985,763
307F 3,985,764
308A 3,985,765
309 3,985,766
314.5 3,985,767
326.33 3,985,768
338 3,985,769
340.6 3,985,770
340.9 3,985,771
343.2R 3,985,772
343.3R 3,985,773
346.2M 3,985,774
346.8A 3,985,775
346.8R 3,985,776
347.2 3,985,777
369 3,985,778
448R 3,985,779
448.8R 3,985,780
3,985,781
455A 3,985,782
465F 3,985,783
465.1 3,985,784
465.5R 3,985,785
465.8R 3,985,786
468D 3,985,787
469 3,985,788
472 3,985,789
3,985,790
473A 3,985,791
480 3,985,792
482B 3,985,793
497A 3,985,794
497R 3,985,795
502.4R 3,985,796
3,985,797
514D 3,985,798
515A 3,985,799
530N 3,985,800
534R 3,985,801
553A 3,985,802
557B 3,985,803
558P 3,985,804
558R 3,985,805
561B 3,985,807
561N 3,985,806
586R 3,985,808
600R 3,985,809
615F 3,985,810
618B 3,985,811
621B 3,985,812
632Y 3,985,813
635D 3,985,814
637R 3,985,815
652P 3,985,816
665R 3,985,817
669P 3,985,818
671R 3,985,819
683R 3,985,820
683.15B 3,985,822
683.42 3,985,823
683.9 3,985,821
827 3,985,824
835 3,985,825
876B 3,985,826
876R 3,985,827
3,985,828
879 3,985,829
880B 3,985,830
880R 3,985,831
888 3,985,832
897R 3,985,833
927N 3,985,834
956 3,985,835

CLASS 261
39A 3,985,836
41D 3,985,837
44R 3,985,838
3,985,839

CLASS 264
4 3,985,840
9 3,985,841
12 3,985,842
24 3,985,843
29.1 3,985,844
40.5 3,985,845
44 3,985,846
51 3,985,847
88 3,985,848
95 3,985,849
98 3,985,850
104 3,985,851
121 3,985,580
132 3,985,852
250 3,985,853

CLASS 266
218 3,985,350

CLASS 270
62 3,985,351

CLASS 272
33R 3,985,352
102 3,985,353
134 3,985,354

CLASS 273
3A 3,985,355
55R 3,985,356
86G 3,985,357
89 3,985,358
95H 3,985,359
109 3,985,360
134AA 3,985,361
162E 3,985,362
173 3,985,363
183B 3,985,364

CLASS 277
9 3,985,365
92 3,985,366

CLASS 279
20 3,985,367
75 3,985,368

CLASS 280
432 3,985,369
605 3,985,370
614 3,985,371
652 3,985,372
3,985,373
730 3,985,374
737 3,985,375

CLASS 282
27.5 3,985,376

CLASS 285
9R 3,985,377
49 3,985,378
340 3,985,379

CLASS 292
69 3,985,380
216 3,985,381

CLASS 294
25 3,985,383
50.6 3,985,382
88 3,985,384

CLASS 296
35R 3,985,385
102 3,985,386

CLASS 297
4 3,985,387
216 3,985,388
347 3,985,389

CLASS 299
31 3,985,390

CLASS 301
6V 3,985,391
63PW 3,985,392
131 3,985,393

CLASS 302
34 3,985,394

CLASS 303
7 3,985,395
21AF 3,985,399
21BE 3,985,400
21CE 3,985,398
21F 3,985,397
21P 3,985,396
85 3,985,401

CLASS 305
27 3,985,402

CLASS 307
47 3,986,038
137 3,986,039
141 3,986,040
205 3,986,041
3,986,042
3,986,043
3,986,044
207 3,986,045
208 3,986,046
228 3,986,047
229 3,986,048
237 3,986,049
252L 3,986,050
254 3,986,051
268 3,986,053
270 3,986,052
3,986,054
271 3,986,055
273 3,986,056
289 3,986,057
296 3,986,058
304 3,986,059
3,986,060
3,986,195

CLASS 308
3.6 3,985,403
5R 3,985,404
9 3,985,405
219 3,985,406
237R 3,985,407
3,985,408

CLASS 310
9.8 3,986,061
172 3,986,062

CLASS 312
271 3,985,409
306 3,985,410

CLASS 313
46 3,986,063
60 3,986,064
94 3,986,065
251 3,986,066
273 3,986,067
318 3,986,068
371 3,986,069
384 3,986,070
404 3,986,071
3,986,072
477R 3,986,073
485 3,986,074

CLASS 315
8 3,986,075
99 3,986,076
389 3,986,077

CLASS 317
16 3,986,078
27R 3,986,079
100 3,986,080
119 3,986,081
120 3,986,082
230 3,986,083
260 3,986,084
262A 3,986,085

CLASS 318
138 3,986,086
227 3,986,087
3,986,088
326 3,986,089
484 3,986,093
488 3,986,090
594 3,986,091
649 3,986,092
696 3,986,094

CLASS 320
2 3,986,095

CLASS 321
3,986,096
3,986,097
45C 3,986,099
45R 3,986,098

CLASS 323
17 3,986,100
20 3,986,101
22T 3,986,102
24 3,986,103

CLASS 324
3 3,986,104
34TK 3,986,105
51 3,986,106
54 3,986,107
60C 3,986,108
61R 3,986,109
3,986,110
71R 3,986,111
78R 3,986,112
85 3,986,113
94 3,986,114
102 3,986,115
3,986,116
133 3,986,117
174 3,986,118

CLASS 325
3 3,986,119
4 3,986,120
37 3,986,121
42 3,986,122
56 3,986,123
305 3,986,124

CLASS 328
62 3,986,125
63 3,986,126
128 3,986,127
133 3,986,128

CLASS 330
4.3 3,986,129
3,986,130
15 3,986,131
18 3,986,132
3,986,133
35 3,986,134
56 3,986,135

CLASS 331
78 3,986,136
94.5C 3,986,141
94.5L 3,986,140
94.5P 3,986,137
3,986,138
3,986,139
107R 3,986,142
111 3,986,143
3,986,144

CLASS 332
16T 3,986,145
3,986,146

CLASS 333
1.1 3,986,147
7R 3,986,148
31R 3,986,149
71 3,986,150
3,986,151
80T 3,986,152
84R 3,986,153

CLASS 334
15 3,986,154

CLASS 335
36 3,986,155
210 3,986,156

CLASS 337
186 3,986,157
246 3,986,158

CLASS 339
14RP 3,985,412
14L 3,985,411
17LM 3,985,413
19 3,985,414
74R 3,985,415
98 3,985,416
122F 3,985,417
177R 3,985,418

CLASS 340
2 3,986,159
5MP 3,986,160
6R 3,986,161
15.5DS 3,986,163
15.5TS 3,986,162
52A 3,986,164
52D 3,986,165
63 3,986,166
146.1AX 3,986,168
146.1BA 3,986,167
146.1C 3,986,169
172.5 3,986,170
3,986,171
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3,986,179
173BB 3,986,180
173CA 3,986,176
173DR 3,986,175
173LT 3,986,173
173R 3,986,174
3,986,177
3,986,178
174TF 3,986,181
258A 3,986,182
276 3,986,183
304 3,986,184
324M 3,986,185
335 3,986,186

CLASS 343
7.3 3,986,187
18E 3,986,188

CLASS 346
74J 3,986,189
74.1 3,986,190

CLASS 350
3.5 3,985,419
7 3,985,420
36 3,985,421
54 3,985,422
96BC 3,985,424
96WG 3,985,423
147 3,985,425
160LC 3,985,427
160R 3,985,426
3,985,428
288 3,985,429

CLASS 353
61 3,985,430
94 3,985,431

CLASS 354
299 3,986,191

CLASS 355
3P 3,985,434
3R 3,985,432
3,985,433
4 3,985,435
8 3,985,436
10 3,985,437
11 3,985,438
46 3,985,439
68 3,985,440

CLASS 356
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96 3,985,442
99 3,985,443
109 3,985,444
118 3,985,447
125 3,985,445
144 3,985,446
169 3,985,448
173 3,985,449
175 3,985,450
199 3,985,451
201 3,985,452
207 3,985,453
237 3,985,454

CLASS 357
13 3,986,192
17 3,986,193
18 3,986,194
22 3,986,196
24 3,986,197
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46 3,986,199
55 3,986,200
79 3,986,201

CLASS 358
4 3,986,202
10 3,986,203
22 3,986,204

CLASS 360
2 3,986,205
3,986,206
6 3,986,207
49 3,986,208
121 3,986,209
123 3,986,210

CLASS 401
30 3,985,455
145 3,985,456
209 3,985,457

CLASS 403
111 3,985,458
217 3,985,459
234 3,985,460
292 3,985,461

CLASS 408
72R 3,985,462
116 3,985,463

CLASS 415
1 3,985,464
189 3,985,465

CLASS 417
9 3,985,466
20 3,985,467
214 3,985,468
216 3,985,472
222 3,985,469
252 3,985,470
315 3,985,473
405 3,985,471
490 3,985,474
539 3,985,475

CLASS 418
61B 3,985,476
122 3,985,477
142 3,985,478
146 3,985,479

CLASS 423
22 3,985,854
27 3,985,855
43 3,985,856
106 3,985,857
3,985,858
238 3,985,859
242 3,985,860
244 3,985,861
281 3,985,862
352 3,985,863
574R 3,985,864
657 3,985,865
3,985,866

CLASS 424
1.5 3,985,867
45 3,985,868
50 3,985,869
57 3,985,870
104 3,985,871
122 3,985,872
177 3,985,873
200 3,985,874
211 3,985,875
229 3,985,876
249 3,985,877
250 3,985,878
251 3,985,879
3,985,880
257 3,985,899
258 3,985,881
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263 3,985,883
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266 3,985,886
267 3,985,887
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269 3,985,884
270 3,985,892
272 3,985,893
274 3,985,894
275 3,985,895
285 3,985,896
321 3,985,897
322 3,985,898

CLASS 425
63 3,985,480
72S 3,985,481
111 3,985,482
112 3,985,483
145 3,985,484
242B 3,985,485
248 3,985,486
304 3,985,487
363 3,985,488
371 3,985,489
381 3,985,490
384 3,985,491

CLASS 426
1 3,985,900
43 3,985,901
257 3,985,903
324 3,985,890
332 3,985,904
427 3,985,905
535 3,985,906
3,985,907
3,985,908
572 3,985,909
3,985,910
582 3,985,902
602 3,985,911
622 3,985,912
650 3,985,913

CLASS 427
12 3,985,914
43 3,985,915
46 3,985,916
52 3,985,917
76 3,985,918
101 3,985,919
207A 3,985,920
317 3,985,921
345 3,985,922
390E 3,985,923

CLASS 428
9 3,985,924
92 3,985,925
97 3,985,926
211 3,985,927
273 3,985,928
290 3,985,929
307 3,985,930
315 3,985,931
326 3,985,932
357 3,985,933
397 3,985,934
401 3,985,935
411 3,985,936
486 3,985,937

CLASS 429
44 3,985,578
51 3,985,581
103 3,985,575
3,985,576
133 3,985,573
162 3,985,574
194 3,985,577

CLASS 431
144 3,985,492
150 3,985,493
175 3,985,494

CLASS 432
2 3,985,495
72 3,985,497
122 3,985,496
136 3,985,498

CLASS 526
1 3,985,938
3 3,985,939
10 3,985,719
15 3,985,715
22 3,985,940
84 3,985,721
113 3,985,718
133 3,985,941
220 3,985,720
270 3,985,942
328 3,985,943

CLASS 528
485 Re.29,004

CLASS 536
17 3,985,727
120 3,985,728

Classification of Designs

D2—	229	241,788		114	241,805		235	241,822		26	241,839		C	241,852		D	241,867
	400	241,789		139	241,806	D10—	46	241,823		27	241,840		13R	241,853		15EE	241,869
D6—	28	241,790		166	241,807		106	241,824		29	241,838		14A	241,857		LL	241,871
	31	241,791		179	241,808			241,825	D23—	23	241,841		D	241,855		PP	241,873
		241,792		181	241,809	D11—	156	241,874		28	241,842		G	241,856		B	241,872
	63	241,793			241,813		164	241,875			241,843		J	241,854		N	241,870
		241,794		182	241,810	D12—	64	241,826		29	241,844	D27—	29	241,858	D47—	6E	241,877
	71	241,795			241,811		185	241,827		48	241,845	D30—	15	241,860	D48—	7D	241,878
	113	241,796			241,812		205	241,828		58	241,846		99	241,887	D52—	3R	241,879
	184	241,797		229	241,814			241,829		150	241,847	D32—	1R	241,861	D83—	1D	241,885
	188	241,798			241,815		211	241,830			241,848	D34—	5SS	241,862		F	241,883
	196	241,799	D9—	9	241,816	D15—	66	241,876	D24—	1D	241,849			241,865		J	241,881
	234	241,800		66	241,817		123	241,880	D25—	13	241,833		E	241,864		Q	241,882
D7—	14	241,801		185	241,818	D19—	20	241,834		18	241,850		K	241,863			241,884
	77	241,802		193	241,819		75	241,835		34	241,831		11R	241,866	D86—	10A	241,886
D8—	14	241,803		219	241,820	D22—	6	241,836			241,832		14C	241,868	D96—	12R	241,859
	113	241,804			241,821		7	241,837	D26—	5A	241,851						

Classification of Plants

P. —	11	3,956	P. —		3,957	P. —	54	3,953	P. —	81	3,955	P. —	88	3,954			

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,985,034	3,985,201	3,985,937	3,985,272	3,984,902	3,985,651
3,985,186	3,985,203	3,985,949	3,985,304	3,984,909	3,985,656
3,985,538	3,985,209	3,985,966	3,985,349	3,984,910	3,985,672
3,986,137	3,985,218	3,985,972	3,985,388	3,984,927	3,985,692
2 : 3,985,371	3,985,223	3,985,982	3,985,412	3,984,928	3,985,730
4 : 3,984,995	3,985,226	3,986,002	3,985,420	3,984,929	3,985,769
3,985,353	3,985,232	3,986,008	3,985,427	3,984,951	3,985,776
3,985,515	3,985,255	3,986,021	3,985,433	3,984,965	3,985,796
3,985,977	3,985,258	3,986,022	3,985,455	3,985,038	3,985,797
3,986,017	3,985,270	3,986,027	3,985,465	3,985,040	3,985,802
3,986,044	3,985,282	3,986,028	3,985,589	3,985,046	3,985,823
3,986,104	3,985,287	3,986,042	3,985,597	3,985,050	3,985,829
3,986,172	3,985,303	3,986,045	3,985,601	3,985,080	3,985,841
3,986,174	3,985,318	3,986,099	3,985,693	3,985,112	3,985,870
3,986,179	3,985,321	3,986,101	3,985,828	3,985,113	3,985,904
6 : 3,984,879	3,985,331	3,986,106	3,985,932	3,985,135	3,985,911
3,984,881	3,985,334	3,986,113	3,985,934	3,985,136	3,985,912
3,984,882	3,985,336	3,986,115	3,986,004	3,985,139	3,985,952
3,984,884	3,985,337	3,986,116	3,986,009	3,985,159	3,985,957
3,984,896	3,985,340	3,986,117	3,986,152	3,985,165	3,985,974
3,984,936	3,985,382	3,986,122	3,986,163	3,985,191	3,985,978
3,984,948	3,985,404	3,986,126	3,986,191	3,985,196	3,986,026
3,984,949	3,985,414	3,986,146	10 : 3,984,987	3,985,210	3,986,049
3,984,953	3,985,426	3,986,153	3,985,714	3,985,228	3,986,072
3,984,960	3,985,428	3,986,155	3,985,805	3,985,230	3,986,075
3,984,962	3,985,454	3,986,159	3,986,011	3,985,240	3,986,170
3,984,973	3,985,459	3,986,167	3,986,037	3,985,247	18 : 3,985,100
3,984,974	3,985,466	3,986,175	11 : 3,985,520	3,985,257	3,985,164
3,984,984	3,985,468	3,986,186	3,986,124	3,985,261	3,985,260
3,984,990	3,985,509	3,986,187	12 : 3,984,893	3,985,290	3,985,267
3,985,019	3,985,548	3,986,188	3,985,117	3,985,295	3,985,289
3,985,021	3,985,623	3,986,196	3,985,140	3,985,311	3,985,737
3,985,025	3,985,632	3,986,200	3,985,168	3,985,317	3,985,752
3,985,036	3,985,634	8 : 3,984,880	3,985,278	3,985,324	3,985,759
3,985,077	3,985,642	3,985,183	3,985,362	3,985,333	3,985,835
3,985,082	3,985,646	3,985,602	3,985,416	3,985,355	3,985,872
3,985,093	3,985,649	3,985,916	3,985,467	3,985,360	3,985,893
3,985,106	3,985,671	3,986,182	3,985,510	3,985,361	3,985,897
3,985,114	3,985,697	9 : Re.29,002	3,985,590	3,985,366	3,985,899
3,985,116	3,985,702	3,984,912	3,985,792	3,985,368	3,986,062
3,985,128	3,985,735	3,984,922	3,986,138	3,985,377	19 : 3,984,935
3,985,129	3,985,736	3,984,933	3,986,168	3,985,383	3,984,937
3,985,131	3,985,770	3,984,950	13 : 3,985,072	3,985,385	3,985,305
3,985,133	3,985,775	3,984,957	3,985,161	3,985,387	3,985,386
3,985,147	3,985,813	3,985,008	3,985,259	3,985,402	3,985,394
3,985,148	3,985,839	3,985,015	3,985,271	3,985,421	3,985,724
3,985,166	3,985,851	3,985,032	3,986,203	3,985,431	20 : 3,984,952
3,985,167	3,985,852	3,985,176	16 : 3,985,185	3,985,472	3,984,969
3,985,174	3,985,853	3,985,188	3,985,187	3,985,508	3,984,978
3,985,179	3,985,894	3,985,251	3,986,092	3,985,616	3,985,239
3,985,200	3,985,915	3,985,265	17 : 3,984,877	3,985,647	21 : 3,984,886

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3,984,891
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3,985,753
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29 3,985,154
3,985,491
3,985,506
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3,985,675
3,985,773
3,986,110
31 3,985,352
32 3,985,101
3,985,152
3,985,855
33 3,985,212
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3,985,801
34 3,984,883
3,984,907
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3,985,011
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3,985,227
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3,985,312
3,985,316
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3,985,485
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6	241,788		241,868		241,794	25	241,789		241,886		241,853
	241,800		241,870		241,796		241,792	36	241,805		241,857
	241,806		241,879		241,807		241,839		241,842	44	241,809
	241,824	8	241,880		241,820		241,846		241,843		241,810
	241,825	9	241,831		241,821		241,871		241,844		241,811
	241,826		241,832		241,822		241,878		241,885		241,812
	241,828		241,836		241,827	26	241,803	38	241,850		241,813
	241,829		241,854		241,845	27	241,790	39	241,795	47	241,872
	241,830		241,864		241,882		241,801		241,817		241,873
	241,834		241,875		241,884	34	241,797		241,847	48	241,849
	241,841		241,881		241,887		241,802		241,851		241,856
	241,860		241,883	23	241,833		241,818		241,861	49	241,876
	241,863	13	241,840	24	241,823		241,862	42	241,798	55	241,808
	241,865	17	241,793		241,837						

PLANT PATENTS

6	3,953	3,954	3,956	17	3,955		

U. S. GOVERNMENT PRINTING OFFICE : O - 1976

U.S. DEPARTMENT OF COMMERCE
Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*